Multiple reference points in investor regret

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Abstract

Regret is the result of a comparison between “what is” and “what might have been”. Although regret is a relevant emotion in the life of investors, research studying the regrets of real investors and how these are influenced by multiple reference points is lacking. We present a field survey that investigated the regrets of real stock investors in relation to multiple “what might have been’s.” We found that their regrets are most influenced by what their outcomes might have been had they not invested, by their expected outcomes and by the best-performing unchosen stocks. In addition, we also found that the feeling of regret was influenced by losses or gains relative to each reference point rather than by the size of the loss or gain.

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1. Introduction

George is planning to invest $50,000 in the stock market. After narrowing the search, he considers three stocks (Yahoo, eBay, and Amazon). He decides to invest in eBay, mainly
due to his expectation that it will provide higher returns than the alternative investments (eBay is expected to increase by 20% within the next year). A year later eBay’s stock price increased 10%, while the price of Yahoo increased by 35% and that of Amazon decreased by 5%. How does George now feel about his decision to invest in eBay? Does he feel regret, because he compares his actual outcome (a 10% gain) to the counterfactual outcome that would have been obtained when he had invested in Yahoo’s (a 35% gain). Or does he feel rejoicing (the opposite of regret), stemming from a comparison with the outcome that would have been had he invested in Amazon (a 5% loss)? George’s post-decisional feelings may, in addition, be influenced by his expected profit (a 20% gain) and what his outcome would have been had he remained inactive (i.e., the non-investment outcome which would be no gain and no loss). How do these four possible reference points influence regret? This is the question that is central in the present manuscript. Additional questions are: Which of these reference points has the largest impact on regret? Do the losses (the unfavorable comparisons between the obtained outcome and each reference point) have larger influence than the gains (the favorable comparisons between the obtained outcome and each reference point)? Put differently, are there asymmetric effects of these reference points on regret? Is investment regret mainly driven by the sign of the outcome (is the outcome a loss or a gain in comparison to the reference point) or more by the magnitude of that loss and gain? We have investigated these questions in large survey with over two hundred real investors, reflecting on their personal investment decisions.

Regret is the most relevant emotion in domain of decision making (Zeelenberg & Pieters, 2006). It stems from the comparison between “what is” and “what might have been” (e.g., Loomes & Sugden, 1982; Van Dijk & Zeelenberg, 2005). Although it has often been argued that regret is a relevant emotion in the life of investors (e.g., Kahneman & Riepe, 1998; Shefrin & Statman, 1986), we do not know of any study actually investigating investors regret. The study we report here is a first attempt to obtain insight in such regrets. We think these regrets are of particular interest because of the different reference points that are naturally associated with investment decisions. At present, we know little about the simultaneous impact of multiple reference points on regret. In most regret studies, subjects are simply asked to indicate their regret over a decision concerning two alternatives (e.g., gamble A vs. gamble B or brand A vs. brand B) with the unchosen alternative being the only reference point. Although some scholars have recognized that decision makers may use multiple reference points in decision making and in judgments of post-decisional regret (Bell, 1982; Boles & Messick, 1995; Inman, Dyer, & Jia, 1997; Oliver, 1996), Frederick and Loewenstein (1999) recently pointed out that the information of multiple reference points and their relative weighting has not been investigated empirically.

To our best knowledge, Tsiros (1998) presented the first regret study in which the choice set was extended to three-alternatives. In his first study, undergraduate students read a scenario describing a business decision. They read that there were three options and that the selected option neither the best, nor the worst. In the second study students chose between three different gambles. The participants indicated the amount of regret they felt. Tsiros found that when the obtained outcome exceeded expectations regret was influenced by

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1 Of course we should note that it is possible that investors may use still other, additional, reference points, such as a stock that investors had not even considered previously, but that has become famous after they purchased the target stock. However, these more incidental reference points are not the focus of our current research.
the best-performing forgone alternative, but when the obtained outcome fell below expectations regret was influenced by the worst-performing forgone alternative.

In the present research we built on and extend the Tsiros (1998) research in three important ways. First, our participants are real stock investors reflecting about their personal investment experiences. As argued earlier, their regrets are understudied and of particular interest. Moreover, because of their personal involvement we can expect that they are sufficiently motivated to provide reliable data. Second, we mainly aimed to study how investors’ regrets are influenced by multiple reference points. For this reason the investors were not asked to self-report the referent points, but instead, they rated how much regret they would feel after they read all performance outcomes in relation to their chosen and the forgone options. Third, we did not give any expectation information. Instead, the investors indicated themselves how many profits they expected to earn from their investments. Thus, it is believed that this field study will meaningfully mirror how an investor makes comparisons among multiple reference points. Before turning to our empirical study, let us describe in more detail how and why multiple reference points may influence investors’ regret.

1.1. Choice of reference points for comparisons

Reference points are important because outcomes are compared to them, and are coded and evaluated in terms of this comparison (Kahneman, 1992). When an obtained outcome compares unfavorable with an outcome that we could have obtained had we chosen differently, regret is evoked. Conversely, if a different choice would have led to a worse outcome, people feel rejoicing. This psychological process of comparing the obtained outcome with other possible outcomes has become known as counterfactual thinking (Roese, 1997).

Counterfactual thoughts are a key determinant of individuals’ judgment about the past. These thoughts can be “upward” (i.e., how an event could have been better) or “downward” (i.e., how an event could have been worse) (Markman, Gavanski, Sherman, & McMullen, 1993). Upward counterfactuals often take the form of “if only...” statements. Consider, for above example, an investor George who thinks, “If only I had bought stock of Yahoo, I would have earned more”. By simulating routes to imagined better realities, investors may benefit from this counterfactual to improve on the outcomes in the future (Roese, 1994; Taylor & Schneider, 1989; Wells, Taylor, & Turtle, 1987; Zeelenberg & Peters, 2006). For example, investors may learn to give up the present stocks to reduce losses, or prompt themselves to make a more detailed investment research the next time. On the minus side, however, thinking about how much better an investment could have gone may devalue the obtained outcome and lead to post-decisional regret (Loomes & Sugden, 1982; Zeelenberg & Van Dijk, 2005; Zeelenberg et al., 1998). We thus expect that in the context of a choice set compromising three stocks, the best-performing unchosen stocks may serve as one of the reference points to influence investors’ post-decisional regrets.

In contrast, downward counterfactuals often take the form of “at least...” statements as in the example of an investor who receives a 10% price increased in his chosen stock and thinks “at least I did not lose money.” Such a downward counterfactual may make investors feel better – in comparison to the −5% one could have gotten, a 10% seems pretty good. Several findings are consistent with this logic. In a gambling study, Markman and his colleagues (1993) found that subjects’ generation of downward counterfactuals
led to immediate feelings of satisfaction. Similarly, Roese (1994) found in three studies that consideration of downward counterfactuals resulted in more positive affect (e.g., relief or rejoicing) than consideration of upward counterfactuals. We thus argue that in the context of a choice set compromising three stocks, the worst-performing unchosen stocks may serve as one of the reference points to influence investors’ post-decisional regrets.

In addition to comparing their obtained outcome with two unchosen outcomes, we believe that investors may also compare their obtained outcome with the outcome of not investing (i.e., the inaction outcome), especially for those who lost money! As Roese and Olson (1995, 1997) have demonstrated, counterfactual thinking is primarily triggered by negative outcomes. Thus, investors will be more likely to generate spontaneous counterfactual thoughts after a negative rather than a positive experience. For example, if an investor failed an investment and then realizes that he would not have lost any money if only he had not made decision to invest in purchasing stocks. Here, the non-investment outcome served as a mental anchor, or reference point, affecting how investors evaluate their outcomes. We thus propose that the non-investment (inaction) outcome would be one of the reference points to influence investor regret. Although we do not have a strong theoretical basis, we suspect that this non-investment (inaction) reference point may be the most influential reference point. We base this expectation on the ample research showing that in general, actions produce more regret than inactions (see, Kahneman & Tversky, 1982; Zeelenberg, Van den Bos, Van Dijk, & Pieters, 2002). Kahneman and Tversky (1982) argued that action is inherently abnormal, and because people are more likely to mutate abnormal than normal antecedents, they are also more likely to construct counterfactuals and elicit regret by subtracting actions performed than by adding actions not performed.

An expectation is an “anticipation of future consequences based on prior experience, current circumstances, or other sources of information” (Oliver, 1996, p. 68). Previous research has documented the impact of self-derived expectations as reference points in the evaluation of outcomes (e.g., Cherry, Ordoñez, & Gilliland, 2003; Oliver, 1996; Ordoñez, Connolly, & Coughlan, 2000; Van den Bos, Wilke, Lind, & Vermunt, 1998). Bridges (1993), for example, indicated that consumers’ expectations regarding a product or service they would select for a particular situation may determine a reference point that impacts how they judge products or services they plan to use in that situation. If outcome does not match up to one’s expectation, people feel disappointment (Bell, 1985; Inman et al., 1997; Loomes & Sugden, 1987; Oliver, 1996; Van Dijk, Zeelenberg, & Van der Pligt, 2003; Zeelenberg & Pieters, 2004; Zeelenberg et al., 1998). A question we investigate in the present manuscript is, “Is investors’ regret also elicited when the outcomes fail to meet their expectations?” We have reason to believe that this is the case. Not only on the basis of the research referred to above, but also on basis of the findings of Sanna and Turley (1996) that unexpected outcomes evoking greater counterfactual activation. Investors typically have positive expectations about future profits of their investments. An investor, for example, may invest in a stock because he or she predicts (and expects and hopes) that it will go up in price, that it will perform well. Oliver (1996) suggested that investors use this price expectation as a basis for comparing performance outcomes. When the outcomes fail to meet their expectations, we expect investors to generate counterfactual thoughts. An investor may think “If only I wasn’t greedy and sold the stocks last week, I would have earned as much as I expected”. Hence, we hypothesize that expectations may also serve as a reference point in the investors’ judgments of post-decisional regret.
Finally, echoing prospect theory’s (Kahneman & Tversky, 1979) prediction that ‘losses loom larger than gains’ we further propose that similar asymmetric effects can occur simultaneously for multiple reference points. That is, negative performance differences between the obtained outcome and each of the reference points will have greater influence on regret than positive performance differences between the obtained outcome and each of the reference points. Mellers, Schwartz, and Ritov (1999, p. 339) go even one step further and state that “the regret function is sensitive to the sign of the difference between outcomes but not to the magnitude of the difference.”

To summarize, in our study of the regrets of real investors we expected to find that: (1) Investors may use multiple reference points such as non-investment (inaction) outcomes, expectations, the best-performing outcomes, and the worst-performing outcomes to assess their regrets; (2) Among these reference points, the non-investment outcome may have the largest impact on regret; (3) Negative performance differences may have greater influence on regrets than positive performance differences. In addition, (4) regret may be more influenced by a loss or gain relative to each reference point rather than by the magnitude of that loss or gain.

2. Method

2.1. Sample and data collection

The sampling frame for the data set consisted of a list of 23,010 stock investors in a regional security company, Fubon Securities, in Taiwan. A random selection of 1500 investors received a mailing that invited them to participate in our study. In the opening of the letter, we stated our purpose and invited respondents to fill out the questionnaires online. The purpose of the study was introduced as trying to understand how stock investment decisions would be evaluated. To ensure the highest possible response in this study, we took the following steps: (1) a pretest was used to streamline the contents of the on-line questionnaires, making it easier and more appealing to complete, and (2) a small gift (about $7) was offered to each respondent to thank them for their assistance; (3) about 14 days after the initial mailing, a second wave of mailings was sent to those of the original 1500 who had not yet responded, and in addition, (4) an invitation to participate was conducted by phone.

A total of 227 respondents took part in the survey. The average age of respondents was just over 38 years; 51% of the respondents were male; they had more than three years of stock investment experience, and held more than seven stocks of the chosen company, on average already for more than four-month period.

2.2. Procedure and dependent variables

The mailing sent to the respondents included a password that was needed to enter the on-line survey. First of all, respondents had to login to their personal on-line account that was linked to the customer database of Fubon Securities. Upon logging in, the first page of the questionnaire introduced our research goal and informed participants that all on-line information received would be confidential and protected. The second page listed three questions: First, “which stock have you most recently purchased?” The respondent was allowed to list one stock only. This stock served as the decision maker’s chosen option.
Second, “what percentage did you expect to earn from that particular stock when you bought it?” This number served as the decision maker’s expected profit (expectation). Third, “before you made the decision to buy that particular stock, which other two stocks did you consider buying but did not buy?” Both stocks are foregone options. One served as the best-performing unchosen option and another serves as the worst-performing unchosen option. The third page provided the respondents with a summary of the information they entered on the first and second page of the on-line questionnaire, including the name of the chosen and unchosen stocks, the expected profit of the chosen stock, and the real profit of the chosen and unchosen stocks for that day (because the survey was directly linked to the customer database of Fubon Securities, the system could precisely determine when the respondents bought the stock and how much they earned up to now). This screen is shown in Fig. 1. On this page, the respondents were asked, via two items, how much regret they would feel if they had to sell this stock today.

<table>
<thead>
<tr>
<th>Fubon Securities</th>
<th>Online Investment Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chosen stock:</td>
<td>E-bay</td>
</tr>
<tr>
<td>Unchosen stock:</td>
<td></td>
</tr>
<tr>
<td>Expected profit:</td>
<td>20%</td>
</tr>
<tr>
<td>Profit today:</td>
<td>25%</td>
</tr>
</tbody>
</table>

Please carefully imagine that if you decide to sell (stock name) today for whatever reason, how would you feel about your previous decision in stock investment? (-3 = strongly disagree, +3 = strongly agree)

How would you feel?

1. I feel sorry for having chosen (stock name).
2. I feel regretful for having chosen (stock name).

Background information:

My sex: _Male _Female

My age:

My experiences on stock investment: __ year(s)

Fig. 1. Example of stimuli showed in the third page of on-line questionnaire. Note: (1) Because the survey was linked to the customer database, the system could easily pick up the historical and current stock prices of these chosen and unchosen stocks, then calculate the percentage of gains or losses immediately. (2) To control for potential order effects, the three options followed a random sequence.
Finally, demographics (including sex, age, and experience in stock investment) were measured. The fourth page once again expressed our gratitude and delivered a message regarding the gift. Respondents took approximately 10 min to complete the on-line questionnaires.

2.3. Data analysis

The goal of this research was to examine how multiple reference points influence the regret that decision makers feel with respect to their investment decisions. The reference points that may be used to evaluate the outcomes of the chosen investment option are the inaction (not having purchased stocks), the expected outcome of the chosen stock, and the outcomes of each of the unchosen stocks. We used a multiple reference points regression model to investigate the impact of these potential reference points. In this, we followed the strategy that was used by Ordoñez et al. (2000)

\[
\text{Regret} = \beta_1 D_{\text{inaction}} + \beta_2 D_{\text{expectation}} + \beta_3 D_{\text{best}} + \beta_4 D_{\text{worst}} + \beta_5 \text{PosInaction} \\
+ \beta_6 \text{NegInaction} + \beta_7 \text{PosExpectation} + \beta_8 \text{NegExpectation} \\
+ \beta_9 \text{PosBest} + \beta_{10} \text{NegBest} + \beta_{11} \text{PosWorst} + \beta_{12} \text{NegWorst}
\]

(1)

where Regret is the average of the two regret items, \(D_{\text{inaction}}, D_{\text{expectation}}, D_{\text{best}}, \) and \(D_{\text{worst}}\) are dummies that represent whether the obtained outcome is better or worse than each reference point. These dummies are set to one, when the obtained outcome is higher than that of the inaction, higher than the expectation, higher than the best-performing unchosen investment, and higher than the worst-performing unchosen investment, respectively. When the obtained outcome is lower than a reference point, the dummy is set to zero. \(\text{PosInaction}, \text{PosExpectation}, \text{PosBest}, \) and \(\text{PosWorst}\) are the performance differences when the obtained outcomes are higher than the other reference points; the value is zero otherwise. \(\text{NegInaction}, \text{NegExpectation}, \text{NegBest}, \) and \(\text{NegWorst}\) are the performance differences when the obtained outcomes are lower than the other reference points; otherwise, zero. Thus, this regression equation includes the effects for all four reference points and asymmetric effects for each.

2.4. Results

We used hierarchical regression to test the hypotheses. Model 1 included four dummy variables \(D_{\text{inaction}}, D_{\text{expectation}}, D_{\text{best}}, \) and \(D_{\text{worst}}\). Model 2 added eight variables of positive and negative performance differences \(\text{PosInaction}, \text{NegInaction}, \text{PosExpectation}, \text{NegExpectation}, \text{PosBest}, \text{NegBest}, \text{PosWorst}, \text{NegWorst}\).

The results for the regression analyses are reported in Table 1. In model 1, three of the four dummy variables were significantly associated with post-decisional regret (adjusted \(R^2 = .261, F = 20.989, p < .001\)). These variables included the \(D_{\text{inaction}} (\beta = -.324, p < .001), D_{\text{expectation}} (\beta = -.214, p < .01), \) and \(D_{\text{best}} (\beta = -.133, p < .05)\). These findings thus revealed that the investor in our sample used three reference points: inaction outcome, expectation, and the best-performing unchosen outcome (upward counterfactual comparison) to access his or her post-decisional regret. The worst-performing unchosen outcome (downward counterfactual comparison), however, was not found to influence regret.
In addition, we performed a direct test of the differences between the significant $\beta$s ($D_{inaction}$ vs. $D_{expectation}$ vs. $D_{best}$) in Model 1. The relevant $z$ tests showed that investors’ regrets were most influenced by the outcome of non-investing. The regression weight for $D_{inaction}$ was significantly higher that those for the expected outcome ($D_{expectation}$) and for the best-performing unchosen outcome ($D_{best}$) ($p < .05$). The weights of these last two reference points were not significant ($p = .27$). These findings evidenced that among three main reference points, the outcome of inaction (i.e., not investing) has the greatest impact on regret. Thus, our hypothesis was supported.

In Model 2 (see Table 1), when the positive and negative performance differences between the obtained outcome and each reference point were entered, we did not find a significant increase of in the prediction of regret (adjusted $R^2$ change and $F$ change, $p = .38$). Adding more and more precise predictors ($\text{PosInaction}$, $\text{NegInaction}$, $\text{PosExpectation}$, $\text{NegExpectation}$, $\text{PosBest}$, $\text{NegBest}$, $\text{PosWorst}$, $\text{NegWorst}$) did not improve the model fit, causing us to conclude that Model 1 was the best-fitting and most parsimonious of the two models.

We did a number of additional analyses. First, in a separate analysis we also included the interactions between the different predictors of model 2. These were all insignificant. Next, in a strictly empirical fashion, we started with model 2 and considered which other variables could be eliminated. We used the backward procedure and in a separate analysis we used the stepwise procedure (which takes care of problems related to multicollinearity). Both analyses resulted in a model with three predictors ($D_{inaction}$, $D_{expectation}$ and $D_{best}$) in the same ranking as in model 1. These findings not only again corroborate that investors regrets were influenced by three reference points and inaction outcome has the greatest impact on regret, but also suggested that Model 1 was an appropriate model to test our hypotheses.

As a result of above analyses, we did not find support for the asymmetric effects hypothesis: negative performance differences have a strong impact on regret, whereas posi-

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model 1 standardized coefficients</th>
<th>Model 2 standardized coefficients</th>
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<tbody>
<tr>
<td>$D_{inaction}$</td>
<td>-.324***</td>
<td>-.290**</td>
</tr>
<tr>
<td>$D_{expectation}$</td>
<td>-.214**</td>
<td>-.131</td>
</tr>
<tr>
<td>$D_{best}$</td>
<td>-.133*</td>
<td>-.046</td>
</tr>
<tr>
<td>$D_{worst}$</td>
<td>-.027</td>
<td>-.056</td>
</tr>
<tr>
<td>PosInaction</td>
<td></td>
<td></td>
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<tr>
<td>NegInaction</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>PosExpectation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NegExpectation</td>
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<td>.148</td>
</tr>
<tr>
<td>PosBest</td>
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<td>-.142</td>
</tr>
<tr>
<td>NegBest</td>
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<td></td>
</tr>
<tr>
<td>PosWorst</td>
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<td>.102</td>
</tr>
<tr>
<td>NegWorst</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjust $R^2$</td>
<td>.261</td>
<td>.264</td>
</tr>
<tr>
<td>$F$</td>
<td>20.989***</td>
<td>7.741***</td>
</tr>
<tr>
<td>Change in $R^2$</td>
<td></td>
<td>.028</td>
</tr>
<tr>
<td>Change in $F$</td>
<td></td>
<td>1.085</td>
</tr>
</tbody>
</table>

* $p < .05$.
** $p < .01$.
*** $p < .001$. 

Table 1
Results of regression analysis predicting reference points for regret
tive performance differences have a weaker impact. (The asymmetric effect is shown by the magnitude of the negative differences coefficients such as NegInaction, NegExpectation, NegBest, and NegWorst being larger than the positive differences coefficients such as PosInaction, PosExpectation, PosBest, and PosWorst.) These findings thereby show that the regret of our investors was mainly driven by a loss or gain relative to each reference point, rather than by the size of that loss or gain.

3. General discussion

Investors may feel regret when they compare the outcome of their investment with what the outcome would have been had they invested differently. Across this field survey, responses of real stock investors provided strong evidence that decision makers use multiple “what might have been’s” in judging their regrets. These important comparison standards, or reference points, include the investors’ outcomes when they decided not to invest (the inaction outcome), their expectations, and the best-performing unchosen stocks.

Among these reference points, we further found that non-investment (inaction) outcome had the largest impact on regret, and that there was no significant difference between the impact of expectation and the best-performing unchosen stock.

While the foregone alternative has long been the dominant focus in most regret studies, the present finding that multiple reference points may influence regret enlarges our understanding of post-decisional regret: investors felt more regret about investing as a whole than about purchasing a wrong stock. This conclusion could not be obtained in many previous studies, because in much of this work, the decisions were explicitly framed as ‘choices’ between alternatives, and not as ‘opportunities’ to pursue a particular course of action or not (see also, Jones, Frisch, Yurak, & Kim, 1998).

As expected, the best-performing unchosen outcomes (upward counterfactual comparisons) also served as one of the reference points to influence investors’ post-decisional regrets. Upward counterfactual thoughts triggered by a negative experience draw our attention to imagined alternatives, illustrate how events could have evolved differently and thus, potentially, make us better prepared to meet similar challenges in the future. For this training we pay “tuition fees” in the form of emotional regret nurtured by dwelling on a loss (Tykocinski & Steinberg, 2005).

In contrast, we did not find any support for the hypothesis that the worst-performing unchosen outcomes (downward counterfactual comparisons) served as one of the reference points in evoking regret. The counterfactual thoughts of “At least I did not lose more money” did not seem to provide investors with any comforts. This finding is consistent with several previous studies (e.g., Markman et al., 1993; McMullen, Markman, & Gavan-ski, 1995; Roese & Hur, 1997; Roese & Olson, 1995, 1997; Sanna & Turley, 1996). That is, downward counterfactual thinking does not seem to attenuate regret. Perceived controllability and repeatability may explain why investor regret was influenced by the best-performing unchosen stock but not by the worst-performing unchosen stock in the post-decision evaluations. Roese and Olson (1995), for example, showed that participants generated more upward counterfactuals for an outcome they perceived to be controllable, but more downward counterfactuals for an uncontrollable outcome. In Markman et al.’s (1993) study, participants who expected to play a computerized blackjack game again made more upward counterfactuals and were less satisfied with the outcome than were subjects who did not expect to play again. Similarly, when an investment decision is
controllable and is likely to occur again, investors have much to gain by generating upward counterfactuals, which can provide information useful for maximizing profit the next time the same situation occurs. Downward counterfactuals, in contrary, may leave one ill-prepared for the future (Markman et al., 1993). Indeed, research on academic performance has shown that students who reacted to outcome feedback on the first round of a puzzle task with upward counterfactual comparisons (as opposed to downward comparisons or no comparisons) were more likely to show improved performance on subsequent rounds of the task (Roese, 1994).

A third trigger of post-decisional regret is the obtained outcomes that fell below investors’ expectations. Investors have expectations about their future profits, about their willingness to invest in specific stocks and about the degree to which these investments will satisfy their needs. By virtue of the under expected outcome, surprising events arouse a need to understand why they occurred – a motive that can be served by counterfactual thinking (Sanna & Turley, 1996). These counterfactual thoughts therefore activate investors’ feelings of regrets. To our knowledge, this is the first study to highlight that expectation is one of the important reference points in evoking regret.

In addition, although many studies have documented that regret and disappointment are independent of each other (e.g., Bell, 1985; Loomes & Sugden, 1987; Van Dijk et al., 2003; Zeelenberg & Pieters, 2004; Zeelenberg et al., 1998), Loomes and Sugden (1987, 1988) suggested the possibility that people make both comparisons. They claimed that “under certain circumstances we might expect regret and disappointment to occur simultaneously: they may be complementary rather than mutually exclusive” (Loomes & Sugden, 1987, p. 120). More recently, Yi and Baumgartner (2004) concluded that regret experiences are sometimes accompanied by negative disconfirmation regarding a chosen alternative; regret and disappointment were positively correlated. Our results in the present study are consistent with these conjectures of multiple reference points.

Finally, we did not find any support for the hypothesis that asymmetric effects occurred simultaneously for multiple reference points. This is, negative performance differences between the obtained outcome and each of the reference points did not seem to have greater influence on regret than positive performance differences between the obtained outcome and each of the reference points. Nevertheless, our results further demonstrated that the feeling of regret is mainly driven by a loss or gain relative to each reference point rather than by the magnitude of that loss or gain, which is consistent with the finding of Mellers et al. (1999).

Before closing, let us return to the questions that motivated the present research. We set out to study the regrets of real investors in order to learn about the multiple reference points that may influence these regret. We found that investors’ regrets are most influenced by what their outcomes might have been had they not invested, by their expected outcomes and by the best-performing unchosen stocks. In addition, we also found that the feeling of regret was largely influenced by a loss or gain relative to each reference point rather than by how much loss or gain. In this way, we have started to unravel the factors that are relevant in a hitherto understudied aspect of the life of investors and of the psychology of regret.

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