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CHAPTER 4:

The Effect of Anticipated and Experienced Regret and Pride on Investors' Future Selling Decisions

4.1 Abstract

This chapter investigates the effect of two emotions, regret and pride, on individual investors' decisions to hold or sell a winning or losing investment, in the form of the disposition effect. The results suggest that regret and pride can predict hold/sell decisions, beyond the effect of general valence. In the loss domain, high experienced and low anticipated regret predict a greater probability of selling a losing investment. In the gain domain, only experienced pride, not anticipated pride, indicates a greater probability of selling a winning investment. The authors discuss the implications of these findings and possible avenues for further research.

4.2 Introduction

Individual investors' decisions to hold or sell an investment may depend on their emotions. For example, regret and pride may explain the occurrence of the disposition effect, by which people tend to hold losing investments (losers) too long and sell winning investments (winners) too early (Shefrin and Statman 1985). Evidence of the disposition effect has been reported in a number of studies employing various methodologies. It has been confirmed by laboratory and online experiments (Weber and Camerer 1998; Lee et al. 2008), and by the trading records of individual investors and professional traders (Odean 1998; Garvey and Murphy 2004). It often leads to inappropriate financial decision making, resulting in losses for both individual investors and firms (Dhar and Zhu 2006). To explain the disposition effect, Dhar and Zhu (2006) assess the effects of individual differences, and Muermann and Volkman (2007) develop a theoretical portfolio choice model that incorporates anticipated regret and pride. Their model reflects Shefrin and Statman's (1985) proposal that investors may take pride in their ability to make profits through their investments, which implies they would be likely to sell winners. However, when selling a loser, their ex-post knowledge suggests that a forgone alternative decision would have resulted in more desirable outcomes, so to avoid this form of regret, investors hold on to their losers (Shefrin and Statman 1985). Although the roles of anticipated regret and pride were proposed, the roles of experienced regret and pride are neglected.

Empirical evidence shows that investors must feel responsible for their buying or selling decisions to feel regret or pride in their decisions, which ultimately leads to the disposition effect. However the roles of regret and pride were theoretically asserted instead of directly tested (Summers and Duxbury 2007). Furthermore, although previous investment decisions and thoughts of counterfactual alternatives influence people's subsequently

experienced satisfaction/regret, there is a missing link between experienced emotions and future investment decisions (O'Curry Fogel and Berry 2006).

Despite the recent research efforts, three issues thus remain unaddressed. First, the effects of anticipated regret and pride on investors' hold/sell decisions have not been tested directly. Second, though Shefrin and Statman (1985) propose the disposition effect results from anticipated regret and pride, the investment process actually consists of a chain of decisions. In addition to anticipating emotions that they may feel after future decisions, investors may experience emotional feedback from previous decisions. We therefore address, for the first time, the relevance of emotional feedback for the disposition effect. This investigation complements previous studies of other consumer consequences, such as switching behavior, complaints, repurchase intentions, loyalty, word of mouth, and customer satisfaction, which show that emotions experienced as a result of previous decisions affect subsequent attitudes and behavior (Chitturi, Raghunathan, and Mahajan 2008; Hennig-Thurau et al. 2006; Zeelenberg and Pieters 2004).

Third, recent developments in emotions research highlight the importance of specific emotions (e.g., regret, pride) compared with overall valence-based emotions (e.g., good/bad, satisfaction/dissatisfaction) (DeSteno et al. 2000; Lerner and Keltner 2000). Whereas general valence is an overall judgment of (dis)satisfaction that results from all negative and positive emotions, the specific emotions approach focuses on the idiosyncratic element of each emotion, which might be negative or positive, including its antecedents, appraisal, and behaviorally induced responses (DeSteno et al. 2000). Because Shefrin and Statman (1985) do not specify why they choose specific emotions rather than general valence, it remains unclear which approach will be relevant for the decision to sell losing/winning investments. This issue is also relevant for a more general discussion, in that general valence is still widely used. For example, Hennig-Thurau et al. (2006) test the role of positive affect, and

(dis)satisfaction commonly appears as a predictor of consumer intentions and behavior (see Chitturi, Raghunathan, and Mahajan 2008; Oliver 1980). Most importantly, previous studies only focused on testing either the effect of anticipated emotions or experienced emotions on consumers' decisions; we contribute to the literature by providing the first test of how anticipated and experienced emotions simultaneously affect subsequent decisions in a dynamic setting.

The reason for focusing our investigation on two specific emotions, regret and pride, is that they share one important element: *sense of responsibility*. One can only experience regret if one feels responsible for a bad decision that cannot be justified (Pieters and Zeelenberg 2007). Other negative emotions, such as anger and disappointment, can be experienced without the feeling of responsibility, but regret cannot. Pride arises from achievements that can be attributed to one's abilities or efforts (Williams and DeSteno 2008). Thus, pride differs from other positive emotions, such as joy, that pride is also linked to a sense of responsibility for the outcome. Summers and Duxbury (2007) find that the mere experience of gains or losses, without being responsible for the outcome, was not sufficient to generate the disposition effect. In financial modelling, Muermann and Volkman (2007) include preferences of anticipated regret and pride in their choice model to predict the disposition effect. It appears that the sense of responsibility is a prerequisite to predict individuals' subsequent decision. Thus, in order to predict holding or selling decisions in dynamic setting, we identify regret and pride to be important candidates of emotions to investigate, due to their associations with responsibility.

Nevertheless, consumers may experience other emotions apart from pride and regret following financial gains or losses, for example, anger or sadness (Westbrook and Oliver 1991). However, these are secondary emotions that come after primary emotions such as regret (Levine 1996). Since our choice of focusing on regret and pride is based in their

association with one's sense of responsibility, other secondary emotions that do not carry this characteristic are not in the scope of this chapter.

In Section 4.3 we present the conceptual framework. Then in Sections 4.4 and 4.5 we report two experiments. Experiment 1 investigates the effects of anticipated and experienced regret on investors' hold/sell decisions in a loss domain; Experiment 2 tests the effects of anticipated and experienced pride on these decisions in a gain domain. We conclude with an overall discussion of the results, their implications, and possible avenues for further research, in Sections 4.6 and 4.7.

4.3 Conceptual framework

4.3.1 Valence-Based versus Specific Emotions Approach

Psychology and consumer behavior literature provide ample evidence that emotions can influence behavior (for a review, see Bagozzi et al. 2000). Two primary approaches model the effects of emotions on behavior: general valence and specific emotions. The first approach, the valence-based approach, consists of a summation of the positivity and negativity of all the emotions that individuals experience and results in an overall level of (dis)satisfaction. In this approach, negative emotions result in more dissatisfaction, while positive emotions result in more satisfaction. The main merit of the valence-based approach is its parsimony (Zeelenberg and Pieters 2004), that it allows all emotions to be summarized into one variable: (dis)satisfaction. The disadvantage of the valence-based approach is that it does not allow for investigating the specific characteristic of each emotion.

The appraisal theory of emotions (Bagozzi, Gopinath, and Nyer 1999) instead implies that cognitive appraisals of situations play an essential role in the elicitation and differentiation of emotions and resulting behavior. For example, both regret and disappointment are associated with disconfirmed expectations. However, disappointment

implies agency related to circumstances (i.e., undesirable outcome caused by circumstances outside the person's control), whereas regret relates to self-agency (i.e., undesirable outcome caused by the self). Each emotion may result in different action tendencies or readiness (Frijda, Kuipers, and ter Schure 1989). Because regret entails a tendency to blame oneself and attempt to correct previous mistakes, it may result in attempts to undo bad decisions. Disappointment instead involves the tendency to attribute a disconfirmed expectation to circumstances and thus reluctance to make decisions. General valence fails to capture such detailed differences.

There has been research in marketing pointing to the effect of both general valence and specific emotions on the decision to hold or sell losing and winning investments. The reported findings imply specific emotions have idiosyncratic elements, relevant for consumer behavior, which are not always captured by a measure of general valence. Zeelenberg and Pieters (2004) find that regret and disappointment directly affect switching, complaining, and word-of-mouth intentions, after they control for general valence. Tsiros and Mittal (2000) also show that general valence directly influences repurchase and complaint intentions, but regret directly influences repurchase intentions only. In the context of financial decision making, no empirical study has yet tested whether specific emotions, such as regret and pride, are relevant for explaining the sale of losing/winning investments. Prior findings thus lead us to the following hypothesis:

H₁: The effects of specific emotions on hold/sell decisions are distinct from that of valence-based emotion, in domains for which specific emotions are relevant.

4.3.2 Anticipated Regret, Anticipated Pride, and Selling Investments

Anticipated regret. Regret results from counterfactual thinking, that is, a comparison between the obtained outcome and what might have been (Bell 1982; Loomes and Sugden

1982). Regret is found to be a primary negative emotion (Tsiros and Mittal 2000) that it is the second most frequently expressed emotion in daily conversations (Shimanoff 1984). Regret is an important emotion to investigate, not only because it is commonly experienced, but also because it has strong behavioral implications. Various studies in marketing have identified regret as a relevant emotion in consumer decision making (e.g., Simonson 1992; Tsiros and Mittal 2000; Zeelenberg and Pieters 2004). Pieters and Zeelenberg (2007) propose that anticipated regret has a prospective element that signals when decisions may be regrettable; it also contains a retrospective element that looks in the past to guide current decisions.

Shefrin and Statman (1985) propose that investors resist realizing losses, which would imply that ex-post knowledge indicates the forgone alternative decisions would have led to better outcomes. For example, if investors sell an investment at a loss, they not only realize the loss but also experience a feeling of regret associated with their previous non-optimal decision. To avoid this experience of regret, investors tend to postpone selling at a loss. According to Reb's (2008) empirical findings about the role of regret aversion in decision making, the salience of regret increases the length and depth of information search and the amount of time before a decision. Lemon, White, and Winer (2002) reveal that consumers who anticipate regret, in the context of dropping an ongoing service provider, are less likely to discontinue the service relationship. Because this type of decision strongly resembles investors' sale decisions, we expect that anticipated regret also affects investors' hold/sell decisions.

In addition, action can lead to more regret than inaction, according to the action effect (Gilovich and Medvec 1995), and from the moment investors initially invest in the product, holding their investment is a decision not to act, or inaction. Selling requires the decision to change the status quo, that is, action. Therefore, selling (action) should produce more regret

compared with holding (inaction), given a constant outcome³. In order to avoid anticipated regret; investors tend to hold losing investment.

H_{2a}: In the loss domain, greater anticipated regret leads to a lesser selling probability.

Anticipated pride. Pride is a positive emotion resulting from achievement, attributed to one's effort or abilities, and it is intrinsically linked to self esteem (Tracy and Robin 2007). Anticipated pride is found to be related to task preference (Trope 1980), self control/ impulse control (MacInnis and Patrick 2006; Patrick, Chun and MacInnis 2009) and brand choices (Simonson 1989) in non-risky settings. In addition, anticipated pride is suggested to be a determinant on consumers' ethical purchasing behavior (Angus-Leppan and Owen 2005). In risky domains, however, there is a gap in the literature regarding a relation between anticipated pride and decisions. While pride has received increasing research efforts in the psychology literature recently (Fredrickson 2001; Tracy and Robins 2007; Williams and DeSteno 2008), anticipated pride is an understudied topic, especially in terms of how it may affect risky or financial decisions. There are, nevertheless, evidences demonstrating the effects of general anticipated feelings on risky decisions. In a non-financial risk domain, anticipated feelings are found to reduce the practice of unsafe sex (Richard, van der Pligt and de Vries 1996). Anticipated feelings also affect individuals' gambling choices in the framework of subjective expected pleasure theory (Mellers and McGraw 2001). The subjective expected pleasure theory proposes that individuals anticipate pleasure for future outcomes of each decision option. Then they weigh each anticipated pleasure by the

³ This interpretation of action and inaction is novel in financial decision making literature. Weber and Camerer (1998) reverse the "selling equals action, holding equals inaction" associations by using an "automatic selling" procedure in their experiment: After each investment period, the stock would be sold automatically. With this procedure, the regret associated with action (sell) declines; participants in their study faced a different set of options: to repurchase or not to repurchase the investment. In this case, repurchase (hold) is the "action" option, and not to repurchase (sell) is the "inaction" option. Their reversal also may have diminished the anticipated regret associated with selling a losing investment, hence their finding that the disposition effect was greatly reduced.

corresponding subjective expectation that an outcome will occur. Finally, the decision option with the highest anticipated pleasure is chosen. This framework deals with anticipated pleasure, which is more of a valence-based than a specific emotion approach. Nonetheless, the arguments underlying this framework may also apply to anticipated pride, that the decision option associated with the highest anticipated pride is expected to be chosen.

Pride was suggested to be the counterpart of regret, in explaining the disposition effect (Shefrin and Statman 1985). Investors are expected to take pride in their sale of a winning investment, because they regard the realized gain as proof they have made good decisions. In order to obtain this sense of anticipated pride, investors have to sell the winners. Thus, anticipated pride is proposed to result in a desire to sell winning investments too soon (Shefrin and Statman 1985). However, this proposition has not been tested directly. Summers and Duxbury (2007) have manipulated the presence of responsibility in their study, but anticipated emotions were not measured explicitly. Although feeling responsible for a decision is a prerequisite for feeling regret or pride, it may not automatically lead to these emotions, thus their study did not provide direct support for the proposed effect of anticipated pride on selling tendency. In the preference model by Muermann and Volkman (2006), they provide mathematical proof that by incorporating anticipated pride and regret in individuals' preferences, investors exhibit trading behavior consistent with the disposition effect. However, the support from this paper is theoretical instead of empirical.

We aim to provide the first empirical testing on the proposition by Shefrin and Statman (1985). Since the feeling of pride is linked to self esteem, when investors sell winning investment, they would feel good about their prior purchase/ holding decision and have a boost in their self esteem. As such, anticipated pride is expected to motivate investors to sell winning investment:

H_{2b}: In the gain domain, greater anticipated pride leads to a greater selling probability.

4.3.3 Experienced Regret, Experienced Pride, and Selling Investments

Experienced regret. Regret regulation theory suggests regret is based on past decisions (experienced) and possible future decisions (anticipated). Furthermore, Pieters and Zeelenberg (2007) propose experienced regret has a retrospective element that informs decision makers about the level of their goal achievement. It strongly depends on prior outcomes (Bagozzi et al. 2000), and it contains a prospective element that shapes subsequent behavior. For instance, marketing literature has shown that experienced regret affects consumers' subsequent repurchase intention, word-of-mouth, switching decisions (Chitturi, Raghunathan, and Mahajan 2008; Zeelenberg and Pieters 2004).

Investing generally involves a chain of decisions, such that regret could be experienced after each decision. We argue that in such dynamic conditions, the probability of holding losing investments decreases as the level of experienced regret increases. Hart and Mas-Colell (2000) propose an adaptive procedure, known as regret matching, such that in a repeated game, players change their current strategy, at probabilities proportional to the regret experienced by not using other strategies previously. Their formulation focuses on how experienced regret that results from a known outcome in the past can predict subsequent choices. In each period, players either persist in using the same strategy or change their strategy. The probabilities of changes are proportional to how much higher the accumulated payoff would have been if the participants had previously changed their strategy. To adapt this finding to decisions involving losing investments, we let U_h be the total payoff resulting from a previous decision h (i.e., hold the investment) and U_s be the forgone payoff of the decision s (i.e., sell the investment). Then, $U_h - U_s$ indicates the level of experienced regret of

having chosen h instead of s , given $U_h > U_s$. Larger differences imply higher levels of experienced regret. Empirical findings support this regret-matching proposition: Consumers who experience more regret tend to change their behavior, such as switching products or service providers (Ratner and Herbst 2005; Zeelenberg and Pieters 2004), or express lower repurchase intentions (Tsiros and Mittal 2000). We argue that switching suppliers or eliminating repurchase intentions resembles selling an investment and hypothesize:

H_{3a}: In the loss domain, greater experienced regret leads to a greater selling probability.

Experienced pride. Shefrin and Statman (1985) also propose that pride motivates investors; specifically, anticipated pride pushes investors to sell winners, because they know they will experience pride when they do so. Because investing involves a chain of decisions, we assume investors not only anticipate pride before selling but may already have experienced pride resulting from previous decisions about a winner.

Despite increasing research into pride in the past few years (Fredrickson 2001; Tracy and Robins 2007; Williams and DeSteno 2008), we still know little about its effects on financial decision making. Fredrickson (2001) suggests pride increases people's scope of attention and broadens their action repertoires, enabling them to obtain greater achievements. Thus, consumers may be more likely to search for alternatives and less likely to continue their relationship with their current product or service providers. Pride also is linked to a sense of autonomy/self-agency, that people attribute positive outcomes to their own abilities and efforts (Williams and DeSteno 2008). They believe the positive outcome is independent of the chosen product/service provider, so their repurchase likelihood declines. Therefore, contrary to the common assumption that positive emotions (e.g. satisfaction) are linked to stronger repurchase intention, feeling of pride can decrease consumers' repurchase intention

(Louro, Pieters, and Zeelenberg 2005). In a financial setting, repurchase intention is similar to intention to hold winning investment. Therefore, in an investment context, we hypothesize:

H_{3b}: In the gain domain, greater experienced pride leads to a greater selling probability.

Together H_{3a} and H_{3b} imply that extreme level of emotions (either regret or pride) in the experience dimension would motivate individuals to opt out and sell the investments. While the experience of regret motivates individuals to “make things right”, the experience of pride motivates individuals to search for alternatives. Both experiences of these emotions lead to a stronger tendency to change the status quo from hold to sell.

Up till this point we have proposed that regret is relevant for predicting selling probabilities in the loss domain, while pride is relevant for predicting those in the gain domain. However, it is conceivable that regret (pride) may also be relevant for the gain (loss) domain in certain scenarios. For example, one can engage in the following mental exercise: in the loss domain, if one chooses to sell a losing investment now and its price drops further in the next time period, then the decision to sell would prove to be a good judgment as it has prevented further losses. Therefore, one may anticipate pride for this scenario. In the gain domain, it is possible to imagine that if one chooses to sell a winning investment now and the stock price increases further in the future, then the decision to sell would be considered too soon as some gain has been forgone, and one may anticipate regret in this scenario. However, these scenarios are not the main focus of this chapter. As this is the first empirical test of how regret and pride affect selling probabilities, we first focus on testing the effects of these emotions in their most relevant domain (regret for loss, pride for gain). We do, however, include a test of the effect of anticipated pride in the loss domain and anticipated regret in the gain domain in our robustness test. We conducted Experiment 1, focused on the loss domain,

to test H_1 , H_{2a} , and H_{3a} , whereas Experiment 2 focused on the gain domain, tested H_1 , H_{2b} , and H_{3b} .

4.4 Experiment 1: Anticipated and Experienced Emotions in the Loss Domain

4.4.1 *Participants and Procedure*

A total of 66 undergraduate students (40 men, 26 women) from a university in The Netherlands, with an average age of 22.79 years, participated. Their reward for participating depended on the final value of their investment. On average, they received about EUR 4. Participants were assigned to individual cubicles and presented with the study scenario: They recently had started investing in a single stock X. The amount initially invested was predetermined and equal for all participants. We specified up to ten investment periods, in which the stock price declined. To enhance the realism of the price patterns, we eliminated the possibility of long runs of losses. After each period, participants received information about the stock's performance and were asked whether they wanted to hold or sell the whole invested amount. Before each decision, they answered a short questionnaire about their experienced emotions. The experiment ended after participants decided to sell the stock; for those who never chose to sell, the experiment ended after 10 periods.

Previous studies of the disposition effect usually employed a limited number of predetermined price patterns (Lee et al. 2008; Weber and Camerer 1998). We randomly generated a wider range of gains or losses and intermediate price dynamics over the (up to) 10 investment periods to enhance the generalizability of the results. We divided the ten investment periods into three phases; this setting was previously used in Lee et al. (2009). In phase 1, with a random assignment of 5%, 10%, 20%, or 40% losses, participants considered a first decrease in the stock price, which was roughly evenly spread out over the initial 1, 3, or 5 periods. In phase 2, the prices remained relatively stable (up or down stock price

movements of around 1%) for either 2 or 4 periods. In phase 3, participants were exposed to a second negative shock in the stock price of 5%, 10%, or 15%, which took place in 1 period. The experiment then ended. In total then, we used 72 possible general price patterns: 4 (first loss: 5%, 10%, 20%, 40%) \times 3 (first losing period: 1, 3, 5 periods) \times 2 (stable prices: 2, 4 periods) \times 3 (second loss: 5%, 10%, 15%). On average, participants held the losing stock for 5.32 (SD = 2.84) periods. When participants sold the losers, they had incurred an average loss of 18.58% (SD = 13.60).

4.4.2 Measures

The dependent variable in the model was the hold/sell decision; anticipated and experienced regret, as well as (dis)satisfaction, served to predict participants' values for this dichotomous variable. We also included several control variables. We derived the measures of experienced regret from Zeelenberg and Pieters (2004), with two questions: (1) "How good or bad do you judge your decision to hold stock X in the last month?" (1 = "very good," 9 = "very bad") and (2) "How much regret do you feel about holding stock X in the last month?" (1 = "none," 9 = "very much"). We averaged their answers to form an index of regret ($\alpha = .74$). We used a single-item measure for anticipated regret, participants imagined that they had sold the investment and indicated on a nine-point scale (1 = "not at all," 9 = "very much") how much regret they anticipated they would feel as a result. To control for the effect of general valence, we derived measures of (dis)satisfaction from Zeelenberg and Pieters (2004). Using a nine-point scale (1 = "not at all," 9 = "very much"), after each investment period, participants indicated how *bad* and *dissatisfied* they felt; as positive opposites of these items, participants also indicated how *good* and *satisfied* they felt. The

averaged answers to these four items formed an index of (dis)satisfaction, for which larger numbers indicated more dissatisfaction ($\alpha = .91$)⁴.

For the control measures, we adopted the two-item measures of disappointment from Zeelenberg and Pieters (2004): (1) “How much disappointment did you feel about the performance of stock X?” (1 = “none,” 9 = “very much”) and (2) “To what extent was the performance of stock X better or worse than you expected beforehand?” (1 = “much better,” 9 = “much worse”) ($\alpha = .60$). We include disappointment as control because previous literature has identified the major difference between regret and disappointment is that disappointment does not entail a sense of responsibility. With this control measure, we can test our assumption that only specific emotions that are linked to responsibility are relevant in a dynamic investment decision setting. We employed a single-item measure of expectations of future price changes, based on Ayton and Fischer (2004): “How do you think the price of stock X will change in the next period?” (1 = “surely decrease,” 9 = “surely increase”). Finally, after answering all questions for emotions and expectation, participants indicate whether they want to hold or sell the stock at the end of each investment period. To control for individual differences, we included age, sex, field of university studies, risk aversion, and investment experience in financial markets, particularly stocks. We adopted the measure of risk aversion from Holt and Laury (2002), who propose a 10-pair lottery choice decision task. By observing when a respondent switches between paired options, Holt and Laury (2002) suggest they can determine how risk averse the person is.

⁴ The measures of (dis)satisfaction, regret, and disappoint are adapted from Zeelenberg and Pieters (2004), who obtained Cronbach’s alphas of these measures of .908, .937, and .882, respectively, consistent with the alphas of these scales in our data.

4.4.3 Results

We collected 351 decisions (frequency of hold = 308, frequency of sale = 43), in which 65% of the participants sold the losing investment (43 of 66). In order to test whether the relevant specific negative emotions (regret and disappointment) affect the general valence ((dis)satisfaction), we followed Zeelenberg and Pieters's (2004) procedure. We first regressed disappointment and regret on (dis)satisfaction. Disappointment ($\beta = .585, p < .001$) and regret ($\beta = .331, p < .001$) both explained the variance in general valence ($R^2 = .663$). These results are consistent with Zeelenberg and Pieters's (2004).

We also conducted multivariate logistic regression analyses to test the hypotheses. Specifically, we regressed the 351 hold/sell decisions on experienced regret, (dis)satisfaction, disappointment, anticipated regret, and expectation of future performance simultaneously. The inclusion of (dis)satisfaction, anticipated regret and experienced regret is to test H₁, H_{2a}, and H_{3a} respectively, disappointment and expectation were included in the analysis as control. The parameter estimates, included in Table 4.1 (see Model 1), indicated that higher experienced regret induced a greater sale probability ($B = .398, p = .037$) and higher anticipated regret led to a smaller sale probability ($B = -.204, p = .040$). Higher (dis)satisfaction predicted a smaller probability of selling a loser ($B = -.446, p = .010$), whereas more negative expectation led to a higher selling probability ($B = -.494, p < .001$). Disappointment did not significantly affect the hold/sell decision ($B = .020, p = .916$). The insignificant role of disappointment on probability to sell confirms our expectation that only specific emotions that are associated with a sense of responsibility seem to be relevant for dynamic investment decisions. As expected, we find opposite effects of anticipated and experienced regret on probability to sell losing investment.

Table 4.1

Results of experiment 1 and 2 (Loss and gain domain)

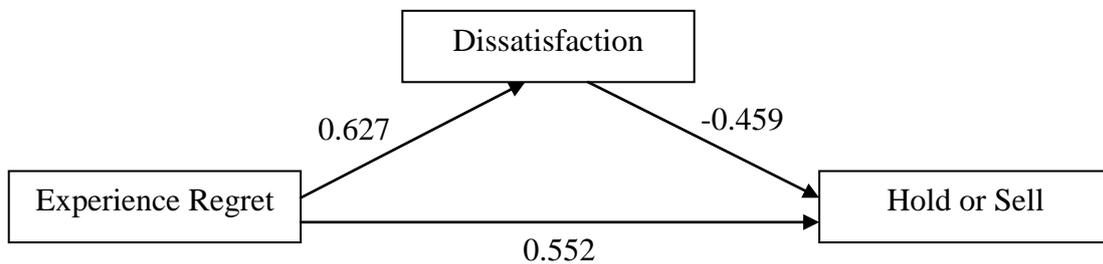
Domain	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
Selling Probabilities (B)								
(Dis)satisfaction	-0.446*	0.174	-0.436*	0.174	-0.440*	0.261	-0.440*	0.231
Experienced regret	0.398*		0.407*		0.403*		0.423*	
Anticipated regret	-0.204*		-0.290**	-0.319**	-0.200*		-0.281*	-0.293**
Experienced pride		0.539***		0.513**		0.606***		0.575***
Anticipated pride		0.014		0.153		0.067		0.192
Disappointment	0.020		0.003		0.047		0.312*	0.027
Expectation	-0.494***	-0.644***	-0.561***	-0.561***	-0.491***	-0.848***	-0.554***	-0.736***
Controls								
Sex					-0.078	1.238*	0.009	1.062*
Age					-0.110	0.110	-0.118	0.135
Risk aversion					0.136	0.110	0.108	0.156
Investment experience (General)					0.577	-0.389	0.635	-0.732
Investment experience (Equity)					-0.683	-1.379	-0.815	-0.990
Business administration studies					0.405	0.087	0.286	-0.331
Cox & Snell R²	0.129	0.202	0.148	0.244	0.139	0.257	0.157	0.285

Notes: * $p < .05$. ** $p < .01$. *** $p < .001$. Risk aversion was measured based on Holt and Laury (2002). Regarding investment experience, participants indicated with a yes/no answer. Although we have participants coming from at least eight fields of studies, they predominantly study within the business administration faculty (108 out of 130). Nevertheless we include a dummy variable to control any possible effect of studying business administration as compared to studying other subjects.

To assess whether the effect of experienced regret is mediated by dissatisfaction, a Sobel test was conducted. Since our dependent variable is dichotomous (hold or sell), we first followed the procedure of MacKinnon and Dwyer (1993) to make the coefficients comparable across equations. Results of the Sobel test indicate that the effect of experienced regret on probability to sell is mediated by dissatisfaction ($z = -3.360, p < .001$).

Figure 4.1

Mediation analysis of experiment 1(loss domain)



In summary, lower anticipated regret and higher experienced regret predicted a higher probability that the participant would sell losing investments. These findings support H_{2a} and H_{3a}, respectively. The effects of anticipated and experienced regret remained significant even after we controlled for the effect of (dis)satisfaction, in support of H₁. Thus, specific emotions, instead of general valence, should be used to predict financial decision making. Although regret explained variance in (dis)satisfaction, the effects of experienced regret and dissatisfaction on the probability of selling losers were opposite: Higher experienced regret motivated investors to sell; higher dissatisfaction motivated them to hold. Therefore, regret should be investigated as a specific emotion, not incorporated into a general valence measure.

4.5 Experiment 2: Anticipated and Experienced Emotions in the Gain Domain

4.5.1 Participants and Procedure

The procedure for Experiment 2 was the same as that for Experiment 1, except that we tested the hypotheses relevant to the gain instead of the loss domain. A total of 64 undergraduate students (40 men, 24 women) from a university in The Netherlands, with an average age of 23.16 years, participated. Their rewards again depended on the final value of their investment; on average, they received about EUR 6.

The price patterns for Experiment 2 were generated with the same random method as in Experiment 1 but represented mirror patterns (i.e., gains instead of losses). On average, participants held the winning stock for 3.34 periods ($SD = 2.18$). When participants sold the winner, they had incurred an average gain of 19.03% ($SD = 14.90$). The large standard deviation reflected the variety of price patterns.

4.5.2 Measures

We used three measures of experienced pride, from Williams and DeSteno (2008). On a nine-point scale (1 = “not at all,” 9 = “very much”), participants indicated how *fulfilled*, *confident*, and *proud* they felt after each investment period. The averaged answers to the three items formed an index of pride ($\alpha = .86$)⁵. As a manipulation check (Williams and DeSteno 2008), participants also answered how well they thought they performed compared with others on the investment task (1 = “much worse,” 9 = “much better”). We used a single-item measure of anticipated pride, in which participants thought about whether they would sell the investment and indicated on a nine-point scale (1 = “not at all,” 9 = “very much”) how much pride they would feel after selling it. We also administered the measures of (dis)satisfaction

⁵ The Cronbach’s alpha of the measure of experienced pride, from Williams and DeSteno (2008), was .81. Of the four items in their measure, we did not adopt *satisfied*, because it overlaps with the valence-based emotion measure.

and the other controls, as in Experiment 1. In the loss domain we include disappointment as a control emotion for regret, in order to establish that the sense of responsibility is important in predicting hold/ sell decisions. The difference of responsibility between disappointment and regret is well supported in the literature. However, such a consensus is not presented for the identification of one single specific emotion that is very similar to pride, but without the sense of responsibility. Therefore we do not include a control emotion for pride.

4.5.3 Results

We collected 214 decisions in the gain domain (frequency of hold = 155, frequency of sale = 59), and 92% of participants eventually sold the winning investment (59 of 64). To discover whether the relevant specific positive emotion (i.e., pride) was a determinant of general valence ((dis)satisfaction), we again followed Zeelenberg and Pieters (2004). The linear regression analysis results showed that pride ($\beta = -.632, p < .001$) explained variance in (dis)satisfaction ($R^2 = .424$).

In the multivariate logistic regression analysis, we regressed the 214 hold/sell decisions on experienced pride, (dis)satisfaction, anticipated pride, and expectation of future performance simultaneously. The inclusion of (dis)satisfaction, anticipated pride and experienced pride is to test H_1 , H_{2b} , and H_{3b} respectively, expectation was included in the analysis as control. The resulting parameter estimates, which we provide in Table 4.1 (see Model 2), indicate that higher experienced pride ($B = .539, p < .001$) entailed a greater sale probability. The effect of (dis)satisfaction on hold/sell decisions about a losing investment proved statistically insignificant ($B = .174, p = .239$). Contrary to our expectations higher anticipated pride did not predict the sale probability ($B = .014, p = .874$), but a more negative expectation related to a higher probability ($B = -.644, p < .001$).

4.6 Discussion

We first compare the overall results in Experiment 1 and 2. As we expected, participants reported more regret and (dis)satisfaction in the loss condition than in the gain condition. The average experienced regret in the loss domain ($M = 5.02$) differed significantly from that in the gain domain ($M = 3.08$, $p < .001$). (Dis)satisfaction in the loss domain ($M = 6.06$) also differed significantly from that in the gain domain ($M = 3.69$, $p < .001$). Participants experienced significantly more pride in the gain domain ($M = 5.07$) than in the loss domain ($M = 3.77$, $p < .001$). With regard to anticipated emotions, participants reported more anticipated regret in the loss domain than in the gain domain and more anticipated pride in the gain domain than in the loss domain. For anticipated regret, $M = 6.48$ in the loss domain, and $M = 5.73$ in the gain domain ($p < .001$), whereas for anticipated pride, $M = 5.15$ in the loss domain, and $M = 5.50$ in the gain domain ($p = .057$). Since the set up of Experiments 1 and 2 are the same except for their domain (losses vs. gains), our results support that regret and pride were the relevant emotions for the loss and gain domains, respectively, consistent with Shefrin and Statman's (1985) propositions. Second, according to our manipulation check, participants in the gain condition believed their performance was better than others' in the investment task. The score on the manipulation check was significantly lower in the loss domain ($M = 4.31$) than in the gain domain ($M = 5.45$, $p < .001$). Third, the findings were consistent with the disposition effect. In Experiment 2, 92% of the participants eventually sold the winning investment, and in Experiment 1, 65% of the participants sold the losing investment.

To validate the logistic regression analyses, we performed six additional multivariate logistic regressions (see Models 3 to 8 in Table 4.1). Models 1 and 2 are based on our theoretical framework, that experienced and anticipated regret (pride) were tested as explanatory variables for selling probabilities in the loss (gain) domain. Models 5 and 6 are

similar to Models 1 and 2 except that control variables were included in these analyses as well. Our results remain robust. In the loss domain, none of the control variables significantly affected the probability of sale. However, we observed a gender effect in the gain domain: Male participants had a stronger tendency to sell winners on average. None of the other controls altered the results significantly.

Models 3 and 4 differ from Models 1 and 2 that they control for the possible effects of anticipated regret in the gain domain and anticipated pride in the loss domain. Our results remain robust that both anticipated and experienced regret are linked to the selling probabilities in the loss domain, and experienced pride has an impact on selling probabilities in the gain domain. And indeed we find evidence that anticipated pride (regret) can be relevant for the loss (gain) domain. Models 7 and 8 are similar to Models 3 and 4, apart from that control variables were included. Again, besides the gender effect in the gain domain, none of the other controls affect our results significantly.

4.7 Conclusion

4.7.1 General Discussion

Previous research considered the roles of anticipated and experienced emotions in decision models (see Anderson 2003), however anticipated and experienced regret/ pride were not measured and tested in the same study. We conducted two experiments to investigate the role of anticipated and experienced specific emotions (i.e., regret and pride) with regard to investors' hold/sell decisions. In Experiment 1, we found that higher experienced regret led to a greater probability of selling a losing investment; in Experiment 2, our results indicated that higher experienced pride predicted a larger probability of selling a winning investment, in support of H_{3a} and H_{3b} . As for anticipated emotions, our results showed that higher anticipated regret led to a lesser probability of selling a losing investment,

but anticipated pride did not significantly affect the sale probability for a winning investment, in support of H_{2a} but not H_{2b} . Thus, with regard to Shefrin and Statman's (1985) propositions that anticipated regret and pride explain the disposition effect, we found support for the former but not the latter claim.

In the loss domain, we hypothesized opposite effects of anticipated and experience regret on selling probabilities in the loss domain, and same direction effect of anticipated and experience pride in the gain domain. We only find support for the former but not the latter because we do not find significant effect of anticipated pride on selling probabilities. Perhaps for pride experience is more important than anticipation, which is not the case for regret. Since it is human nature to avoid pain and seek pleasure, the trade-off between anticipated regret and experienced regret in terms of avoiding pain is very important. It is because when experienced regret becomes sufficiently high, individuals no longer need to avoid pain by holding on loser because they are already experiencing a high level of regret. As such, both anticipated and experienced regret are influential on selling probabilities since they offer the values to make the trade-off. However, in the gain domain both anticipated and experienced pride are related to pleasure seeking. Since the effects of anticipated and experienced pride are not opposite as those of anticipated regret and experienced regret, there is no trade-off effect between anticipated and experienced pride. When facing constant positive outcome, individuals prefer to obtain it soon than later due to time discounting. Thus, what can be experienced now is more important than what is anticipated at a later time point. This may be why experienced pride affects probability to sell winners but anticipated pride does not. Nonetheless, this is an issue for further investigation. Pride is an understudied topic, let alone the anticipation of pride. More research is needed to investigate the relation between anticipated and experienced pride, and how they affect individuals' risky decisions.

In our analysis, (dis)satisfaction did not significantly affect participants' hold/sell decisions in the gain domain, and the effects of both anticipated and experienced regret in the loss domain remained significant when we controlled for (dis)satisfaction. These findings provide support for H₁, because the effects of specific emotions were not completely captured by the valence-based measure. Overall we provide the initial evidence that both anticipated and experienced emotions (anticipated regret, experienced regret, experienced pride and (dis)satisfaction) are influential on investors' decision to hold or to sell in a dynamic setting.

An important issue for future research concerns the conditions under which a valence-based or a specific emotion is more useful in understanding consumer behavior (Bagozzi et al. 2000; Zeelenberg and Pieters 2004). Our results highlight the importance of this issue. In the loss domain, while valence-based emotion (dissatisfaction) leads to less probability to sell, a specific emotion (experienced regret) predicts a larger probability to sell. These opposite effects have not been identified in previous consumer research (Zeelenberg and Pieters 2004). A possible reason for these results is that our results are obtained on a risky and dynamic decision setting. In a riskless setting, when consumers' expectation of a service or products is not met, the poor performance of the product/ service was determined. Consumers then feel regretful and dissatisfied with prior purchase decision, which results in a higher probability to switch provider. However, in the financial market, a losing investment may bounce back in the future. The investment return is not determined until the point where the investment is sold. In such a risky setting, the effects of general valence and specific emotions seem to be different as compared to those in a riskless setting. Further investigation is needed regarding this issue.

The reported results also have several theoretical implications. First, we have provided partial empirical support for the propositions offered by Shefrin and Statman (1985): Anticipated regret causes people to hold on to losers, but anticipated pride does not

seem to cause them to sell winners. In addition, we contribute to the literature by initially testing how anticipated and experienced emotions affect consumers' decision simultaneously. We demonstrate that experienced emotions can explain the disposition effect, together with anticipated emotions. We also acknowledge that investing requires a chain of decisions, so the emotions experienced as a result of prior outcomes should affect investors' decisions. Zeelenberg and colleagues (2002) point out that whereas previous studies have established a relation between specific emotions and corresponding thoughts, action tendencies, and goals (Frijda, Kuipers, and ter Schure 1989), it remains unclear how experienced regret may cause behavior. Studies that attempt to establish this link are rare (Tsiros and Mittal 2000; Zeelenberg and Pieters 2004), but we contribute to current understanding. Our findings show that even before an account is closed at a loss, investors already experience regret, which leads to a larger selling probability. Our empirical evidence has revealed that when experienced regret is high, investors become much more likely to change their investment decision from hold to sell, in support of the theoretical regret-matching procedure (Hart and Mas-Colell 2000).

Our findings are consistent with previous studies; specific emotions have unique effects over and beyond that of general valence in predicting consumer behavior. Yet whereas prior marketing studies on specific emotions versus general valence focus on riskless environments (e.g., Zeelenberg and Pieters 2004), we provide research evidence from a financial investment domain, which inherently includes risky decisions. Finally, we show that emotions play an important role in investment decision making. According to Mellers and McGraw (2001), anticipated emotion improves the predictability of choice, over and beyond that of subjective expected utility theory. We suggest that the predictive power of a financial decision-making model can be improved by the addition of both anticipated and experienced emotions.

Our findings show that experienced emotions can explain the disposition effect. Emotions research reveals that emotions provide feedback based on prior actions and shape subsequent decisions. We thus posit a link between value creation/perception and emotions. Perhaps emotions, whether anticipated or experienced, provide input regarding the value of subsequent options that investors face. Further research should investigate how the implications derived from emotions research can be incorporated into economic theories and models to provide better predictions of investors' financial decisions.

4.7.2 Limitations and Further Research

We note several limitations. First, we conducted our experiments within a short time frame, but in reality, investors often have more time between their receipts of various information about changes in the stock's value. Further research should try to replicate our findings in a (more) natural setting. Second, the generalizability of our study can be questioned, because the participants in our experiments were students who may not represent the general population of investors in terms of their trading experience, income, wealth, risk aversion, and so on. Additional research would benefit from using a larger and more representative sample.

We also researched two specific emotions, regret and pride. Other specific emotions could be considered in the sale of winning or losing investments too; for example, shame and guilt may affect such decisions. Shame and regret are both negative emotions. However, whereas regret relates to counterfactual thoughts about previous decisions/behavior, shame arises when the social self is threatened, in the form of social esteem, status, or acceptance (Dickerson, Gruenewald, and Kemeny 2004). The participants in our experiments knew that their (individual) results would be kept confidential, so the level of social self-threat was relatively low. In practice though, investment performance may be more transparent. For

example, investors may discuss their performance with others and feel reluctant to realize a loss because they would experience shame. They also could experience guilt if their investment decision led to negative outcomes for others (e.g., loss of children's college fund in the stock market). To gain insight into the roles of specific emotions in investment decision making, a broader set of emotions should be investigated in the future.

