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CHAPTER 1: INTRODUCTION

1.1 General Motivation

In traditional finance and within the traditional economic paradigm, economic agents are assumed to be perfectly rational, such that agents keep their knowledge and beliefs updated according to the Bayesian updating rule, and make optimal decisions based on the subjective expected utility framework (Barberis and Thaler 2005). However, over the last three decades, a growing body of behavioral finance literature has demonstrated that people in reality behave far from completely rational (Barberis and Thaler 2005).

This dissertation focuses on the so-called disposition effect, one of the most intriguing phenomena in decision making under risk, particularly in financial markets. The disposition effect describes the investors' tendency to hold their losing investments too long and sell their winning investments too early. The disposition effect is not only found in experimental studies, (Weber and Camerer 1998; Lee, Park, Lee and Wyer 2008), but also in real data obtained from the stock and property markets (Odean 1998; Garvery and Murphy 2004; Genesove and Mayer 2001). Empirical findings show that investors in the stock market hold their losers 1.6 times longer than they hold their winners, and this trading pattern cannot be explained by attempts to rebalance portfolios or to avoid transaction costs (Odean 1998). DeBondt and Thaler (1985) find that portfolios of prior losing stocks outperform the portfolios of prior winning stocks over the next three years, which is known as the winner-loser effect. However, Odean (1998) finds that the disposition effect is not justified by subsequent investment performance, because the sold winners on average outperform the unsold losers. This phenomenon is important because it leads to suboptimal financial decision-

making, and influences households' current and future wealth (Dhar and Zhu 2006; Odean 1998).

According to Shefrin and Statman (1985), the disposition effect can be explained by prospect theory, mental accounting, anticipated emotions, and self-control. Among these explanations, prospect theory (Kahneman and Tversky 1979) is the most prominent. Based on the s-shaped value function in the prospect theory framework, individuals tend to be risk averse in the gain domain and risk-taking in the loss domain. Therefore, when facing a paper gain, individuals tend to take the risk-free option (i.e. sell) as opposed to the risky option (i.e. hold). When facing a paper loss, individuals tend to take the risky option instead and hold on to their losing investment. Dhar and Zhu (2006) investigate the disposition effect at the individual level. They find that individual differences in terms of socio-economic variables, such as wealth and occupations, among retail investors (i.e. individual who trade securities for their personal account) can also explain their propensity to sell winners and hold losers. In addition, Lee, Park, Lee and Wyer (2008) suggest that the disposition effect can be explained by subjective values that investors attach to possible gains and losses, rather than their expectation for future increase or decrease in stock price.

Previous studies regarding the disposition effect primarily focus on comparing the propensity of selling in the gain versus the loss domain by means of cross-sectional analysis (Dhar and Zhu 2006; Odean 1998), but little is known about the investors' decision-making process in a more realistic dynamic setting with multiple decision moments. A key question remains unanswered: what are the determinants of investors' decisions to sell their winning or losing investments in a dynamic setting? In the loss domain, although investors are less inclined to sell losers, many of them eventually sell if losses accumulate further. Combining the empirical evidence that investors tend to avoid the realization of losses relative to gains, with the phenomenon that many investors eventually do sell their losing investments, leads to

the seminal question of this dissertation: what are the precise determinants of this capitulation decision? In the gain domain, investors are presented with evidence that their investments are bringing in positive return. Why would they choose to sell these winning investments with a good track record, instead of selling those with negative performance?

This dissertation adds to the existing literature by providing the first effort to investigate the disposition effect in a dynamic setting. Since investment involves in practice multiple decision moments, understanding individuals' trading behavior requires further evidence regarding their decision-making process in a dynamic setting. In this dissertation, we make use of experimental methods to investigate individuals' decision-making process. We propose and empirically test two novel explanations of investors' selling decisions, namely (1) adaptation of reference point, and (2) anticipated and experienced emotions. Both of these explanations are linked to bounded rationality. Correspondingly, the dissertation is divided into two themes. We believe that these two explanations are promising, because both prospect theory and emotions have been suggested as explanations for the disposition effect in the literature. Although we have a dynamic perspective, we expect these explanations also apply to our studies. Since prospect theory and reference points are used to explain why investors tend to hold losers, we believe they can also explain why people eventually sell losers. And since Shefrin and Statman (1985) suggest emotions can explain the investors' propensity to hold losers and sell winners, we follow up on this idea and expect that emotions can also explain why investors eventually sell losers.

In this dissertation we concentrate on selling decisions in the loss domain, because empirical evidence has shown that people are not inclined to sell losing investments. What determinants would eventually motivate the capitulation decisions remains unclear in the literature. By focusing on the loss domain, we aim to provide more insights to the question of

what are the main determinants of investors' capitulation decisions. Nevertheless, we have also included the gain domain in Chapters 3 and 4 to provide comparisons.

1.2 Dissertation Themes

1.2.1 Theme I: Adaptation of Reference Points

The first theme of the dissertation is devoted to the examination of how individuals' adaptation to losses over time links to their capitulation decisions. Adaptation to a financial loss, or (reference point) adaptation, means that an individual's reference point is adjusted to the decreased value of the losing investment. Thus, the individual perceives the loss to be smaller/less painful. We refer to investors' decisions to stop losses by selling the losing investment as capitulation decisions. To the best of our knowledge, the analysis here is the first effort to examine investors' capitulation decisions in a dynamic setting with multiple decision moments.

The first theme of the dissertation is divided into two chapters. In Chapter 2 we investigate our novel explanation for the disposition effect: adaptation of the reference point. The reference point is here not specified as static, instead, it adapts in the direction of a prior outcome, upwards for gains and downwards for losses (Arkes, Hirshleifer, Jiang and Lim 2008). In the loss (gain) domain, a downward (upwards) adjustment of the reference point implies that the perceived size of the incurred loss (gain) becomes smaller. Any subsequent price of the investment is evaluated relative to this adapted reference point. We integrate prospect theory (Kahneman and Tversky 1979), adaptation level theory (Helson 1964), expected utility theory (e.g. von Neumann and Morgenstern 1944; Harless and Camerer 1994) and evidence on reference point adaptation (Arkes et al. 2008), in order to specify a dynamic model to predict how investors' adaptation affects their capitulation decisions in a setting with multiple decision moments. The standard expected utility model implies that

investors' expected utility of an outcome is a function of (1) their subjective expectation of future value changes of the investment, and (2) the subjective values attached to these objective value changes (Lee et al. 2008). We propose that subjective values attached to future expected increases or decreases in the price of an investment depend on the investor's adapted reference point. Therefore, we expect that the interaction between (1) subjective expectation and (2) subjective value affects the investor's expected utility of future outcomes, and his/her probability to sell a losing investment. Consistent with our theoretical framework, we find empirical evidence supporting the relevance of the interaction between expectation and adaptation as a key determinant of an investor's capitulation decision on his/her financial investment. Chapter 2 is based on Lee, Kraeussl, Lucas and Paas (2008).

Chapter 3 is the second chapter of the first theme of this dissertation. The findings reported in Chapter 2 suggest a link between the investor's level of adaptation of the reference point and his/her capitulation decision. Chapter 3 builds upon this insight and aims to further enhance the understanding of reference point adaptation at the individual level. The coping literature has demonstrated that differences in personality affect how individuals adapt to various stressful events, such as physical pain and traumatic experiences (Morgan, Matthews and Winton 1995; Miro and Raich 1992). The objective here is to apply these findings to another type of stressful events, namely financial losses. Many studies in the coping literature are based on the Big Five model of personality (Bishop et al. 2001; David and Suls 1999). We expect that this model provides a useful context for assessing individual differences in adaptation to financial losses. The Big Five personality traits are: (1) extraversion; (2) agreeableness; (3) conscientiousness; (4) emotional stability (versus neuroticism); and (5) intellect (Goldberg 1992). A recent meta-analysis study by Connor-Smith and Flachsbart (2007) indicates that the Big Five personality traits are linked to individuals' ability to adapt to/cope with various stressful situations. Although most

individuals are capable of adapting to ups and downs in life satisfaction (Brickman, Coates and Janoff-Bulman 1978; Kahneman 1999), their extents of adaptation vary (Lucas, Clark, Georgellis and Diener 2003). Our goal is to test the proposed link between the Big Five personality traits and adaptation of reference point in the context of financial/investment decisions. We show that individuals scoring higher on agreeableness and intellect, and lower on conscientiousness adapt to prior losses to a larger extent. This implies that these more adapted investors are more likely to attach higher subjective positive value for future gain and lower negative value for future loss, as compared to those individuals who have adapted less to prior losses. This chapter is based on Lee, Kraeussl and Paas (2010).

1.2.2 Theme II: Anticipated and Experienced Emotions

The second theme of this dissertation deals with the examination of the effects of anticipated and experienced emotions on selling decisions and consists of one chapter. In Chapter 4 we test our second novel explanation for the disposition effect, namely the role of emotions within financial decision-making. In particular, we examine how anticipated and experienced emotions simultaneously affect investors' decisions to hold on to or to sell an investment in the more realistic dynamic setting of multiple decision moments. Within the consumer behavior literature, experienced emotions are found to have a significant impact on consumers' switching, complaining, and word-of-mouth intentions (Tsiros and Mittal 2000; Zeelenberg and Pieters 2004). Anticipated emotions can affect consumers' likelihood to discontinue a service relationship as well (Lemon, White, and Winer 2002). We argue that switching decisions in the marketing domain are very similar to capitulation decisions in the finance domain, as both of these decisions involve the discontinuation of a relationship between an individual and a product/service with negative performance. Therefore, we expect both anticipated and experienced emotions to predict investors' selling decisions. We refer

experienced emotions as the emotions that one is feeling at the moment, and anticipated emotions as the emotions that one expects to feel in the future. Anticipated regret and anticipated pride have been suggested as explanations for the disposition effect (Shefrin and Statman 1985), but this proposition has not been empirically tested. Moreover, the investment process in practice consists of a chain of decisions. These dynamics have not been motivated by Shefrin and Statman (1985). In addition to anticipated emotions that individuals expect to feel after future decisions, investors may experience emotional feedback from previous decisions as well. Since both anticipated and experienced emotions may affect investors' subsequent behavior, we argue that these two effects should be examined simultaneously in a dynamic setting.

We focus on two specific emotions: (1) regret for the loss domain and (2) pride for the gain domain. In the loss domain, regret results from counterfactual thinking, that is, a comparison between the obtained outcome and what might have been (Bell 1982; Loomes and Sugden 1982). In the gain domain, pride is a positive emotion resulting from achievement, attributed to effort or abilities (Tangney 1999; Tracy and Robins 2007). We build our hypotheses upon the appraisal theory of emotions (Bagozzi, Gopinath, and Nyer 1999) and regret regulation theory (Pieters and Zeelenberg 2007). According to the appraisal theory of emotions (Bagozzi, Gopinath, and Nyer 1999), cognitive appraisals of situations play an essential role in the elicitation and differentiation of emotions and affect individuals' subsequent decision. Regret regulation theory (Pieters and Zeelenberg 2007) suggests that regret has implications for individuals' behavior. For example, people are more likely to choose an option that involves less anticipated regret. Our experimental findings indicate that 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,

predicts a greater probability of selling a winning investment. This chapter is based on Lee, Kraeussl and Paas (2009).

1.3 Outline

This dissertation critically reviews the literature in the fields of marketing, finance and psychology, in order to understand the psychological aspects of the disposition effect. There are three empirical studies presented in Chapters 2, 3 and 4. Chapter 2 tests a dynamic model of how investors' adaptation to losses is linked to their capitulation decision. Chapter 3 investigates whether individual differences in personality traits affect people's adaptation to gains and losses. Chapter 4 tests how anticipated and experienced emotions affect investors' decisions to hold on to or to sell an investment. Chapter 5 summarizes the main results and implications from the previous chapters, and discusses ideas for future research.