A Dual Qualitative Investigation of Small Investor Behavior in a Simulated Bear Market: Findings from Semi Structured Interviews and a Focus Group

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Abstract

The two qualitative studies presented in this article explore the influence of psychological factors on investment decision-making processes, particularly in the context of a bear market. They are part of the field of behavioral finance, which highlights how emotions and cognitive and behavioral biases can prevent investors from taking a purely rational approach.

Based on experimental finance and using semi-structured interviews and a focus group, both analyses followed a qualitative perspective to assess the nuances of decision-making and, more specifically, through biases and emotional dimensions. They were conducted with eight management science students from the University of Mons who participated in a three-day trading simulation with a virtual portfolio.

Emotions were found to be forces shaping judgment and decisions. In this perceived bearish environment, fear and anxiety about losses and uncertainty were strongly present, as were frustration, discouragement and feelings of powerlessness. Although less frequent, initial positive emotions were also observed, which could lead to overconfidence. These emotions activate and reinforce several biases. Loss aversion was very prevalent, with participants viewing virtual losses as real and hesitating to close losing positions. Anchoring bias was evident in an attachment to initial positive performance, while confirmation bias resulted in a search for information that would confirm hopes of a rebound. Overconfidence, related to early successes, could lead to

poor risk assessment and the persistence of inappropriate strategies. Other biases, such as familiarity bias and the use of heuristics, were also identified.

Emotions (considered as prerequisites for biases) and biases themselves had a significant impact on trading decisions. Behavioral responses included decision paralysis and resignation due to feelings of powerlessness. Loss aversion was often strongly influenced by emotions, and impulsive decision-making or the desire for 'revenge' drove some to take significant risks to regain control (which was basically an illusion). The persistence of inappropriate strategies was also noted despite bearish market signals and a low probability of a market reversal. Decisions were also influenced by the social context of the simulation (including ranking and informal collaboration) and financial results.

In short, both analyses highlight the difficulty of maintaining rational thinking patterns in a bear market. They reinforce the idea that emotions and biases are key components of financial decision-making, often at the expense of objective analysis. However, managing emotions appears to be crucial for effective decision-making.

The article will be structured as follows: in the first section, we introduce our research topic. In the second section, we consider a state of the art concerning emotions and the selected biases and their influence on decision-making. The selected methodological perspective and data collection are presented in the third section. The fourth section is about the experimental protocol. The fifth is dedicated to presenting the results from two selected qualitative tools. They are discussed in the next section. A concluding section is presented, and the last section will suggest avenues for further research.

Keywords: Emotions, Cognitive Biases, Decision-Making, Simulation, Behavioral Finance, Experimental Finance.

1. Introduction

Financial decisions, particularly in stock markets, have long been addressed from a traditional perspective, whereby investors are viewed as perfectly rational actors whose choices are driven by the maximization of their utility and a systematic assessment of the costs and benefits of each option (Singh, 2012). According to this perspective, investors operate without their judgment influenced by emotions or biases (Chenini & Jarboui, 2024).

However, this idea is being questioned increasingly. The cognitive limitations of individuals and the constant flow of information in stock markets are major factors that challenge the idea of perfect rationality (Pak & Mahmood, 2015). In this context, behavioral finance has become a key area of study, offering a nuanced view of investor behavior, namely for small investors. It highlights the significant impact of psychological factors on judgment and decision-making processes, revealing that investor behavior cannot be reduced to rational logic. On the contrary, it results from a complex interaction between bounded rationality, emotions and biases. Behavioral finance focuses in particular on understanding the emotional mechanisms that influence decisions,

especially among individual investors, who appear particularly vulnerable to market uncertainty and emotional pressures (Treffers et al., 2020 ; Tian, 2024).

Financial literature indicates (see State of the Art below) that negative emotions, such as fear and anxiety in times of uncertainty or loss, can modify perceptions of risk and gains, resulting in cautious choices or, conversely, increased risk-taking. Similarly, positive emotions such as happiness or satisfaction are likely to generate overconfidence, which can cause an overestimation of abilities and excessive risk-taking.

In connection with these emotion-related factors, cognitive and behavioral biases also influence decision-making, which can result in irrational behavior. These include overreacting to market fluctuations, inaccurate risk assessment, a preference for familiar companies, and a tendency to use mental shortcuts (heuristics). These biases can encourage decision-making driven more by emotions and biases than by a rational analysis of the available information. The idea that emotions and biases interact also helps explain why individual investors sometimes deviate from rational behavior. This psychological dynamic is sometimes seen with behaviors that aren't covered by traditional finance (like deciding not to do anything).

2. State of the Art

Decision-making, particularly in highly uncertain environments such as stock markets, has long been based on a traditional model of investors considered as perfectly rational agents, guided by the maximization of their utility and methodically evaluating the costs and benefits of each choice (Roland-Lévy & Kmiec, 2016).

However, this perspective is increasingly being challenged, particularly due to individuals' cognitive limitations and information overflow on stock markets (Pak & Mahmood, 2015). In this context, behavioral finance is a key field of research. It highlights the influence of psychological factors on judgment and decision-making processes, revealing that investor behavior is not strictly rational, but rather the result of a complex combination of bounded rationality, emotions and cognitive biases. Compared to institutional investors, individual investors appear to be particularly exposed to these influences. According to Kabbaj (2015), stock markets attract two main types of investors: on the one hand, beginners and novice investors, who are often guided by their emotions and prone to some psychological biases; on the other hand, professional investors, who are better protected from biases through established and proven decision-making processes.

Based on the work of Mushinada (2020), individual investors' decisions reflect simultaneously rational and irrational patterns of thinking. Furthermore, the literature highlights that these financial behaviors are strongly influenced by socio-demographic variables such as level of education (Guiso et al., 2001), gender (Joshi et al., 2022), age (Rekik & Boujelbeneau, 2013) and past experiences (Mouna & Anis, 2015), which shape emotional sensitivity and exposure to biases.

From this perspective, behavioral finance does not just question the assumption of perfect rationality that underlying classical financial decision-making models. It also

aims to understand the emotional mechanisms that influence the choices of individual investors, who are more exposed to market uncertainty and psychological pressures. Several studies have explored the impact of these emotions on decision-making. For example, anger, although negative, can be associated with optimism bias, poor and impulsive decisions, and reduced risk perception (Lerner & Keltner, 2001; Tsai & Young, 2010; Lerner & Tiedens, 2006). It would also encourage risky decisions, while selectively focusing attention, which limits information processing (Hutcherson & Gross, 2011; Hassan et al., 2013; Yang et al., 2018). However, it does not impact decision-making speed (Meissner et al., 2021).

Conversely, anxiety, which is highly prevalent during uncertainty or loss, changes perceptions of risk and gain, resulting conservative decisions that often generate low returns (Raghunathan & Pham, 1999; Gambetti & Giusberti, 2012; Bishop & Gagne, 2018). Fear, on the other hand, reinforces pessimistic expectations and results in defensive choices, thereby reducing investor performance by limiting their decision-making effectiveness (Lo et al., 2005; Lerner & Keltner, 2001). Sadness, although a negative charged emotion, is related to increased risk-taking, while disgust acts as an avoidance mechanism, reinforcing risk aversion and reducing exposure to losses, but also to potential gains (Sparks et al., 2018; Matsumoto & Wilson, 2023). On the positive side, emotions such as happiness, satisfaction and relaxation have a more mixed impact. While they can strengthen confidence, they are also likely to generate overconfidence, especially after initial successes, leading to an overestimation of abilities and excessive exposure to risk (Gosling & Moutier, 2017; Wang et al., 2014). In a bull market, these emotions can therefore encourage risky behavior despite uncertain economic conditions.

In this article, and following Lerner et al. (2015), we assume that emotional forces are prerequisites for the emergence of cognitive and behavioral biases. Those biases can significantly influence the investment decision-making process, giving rise to a variety of irrational behaviors. These include exaggerated reactions to market fluctuations, inaccurate risk assessment, a pronounced preference for domestic companies (Ivkovic & Weisbenner, 2005), frequent use of heuristics or mental shortcuts (Fernandes et al., 2014), and a tendency to minimize potential regret in the event of a loss and maximize the satisfaction associated with gains (Strahilevitz et al., 2011). Furthermore, these biases can lead to decision-making that is driven more by emotions than by a rational analysis of the available information (Konteos et al., 2018).

Deviations from rationality found in individual investors arise from the interaction between emotions and cognitive and behavioral biases. This psychological dynamic has a strong influence on how individual investors react to uncertainty in the stock markets. As a result, in situations seen as out of control, many investors become inactive, passive or even resigned, showing a kind of powerlessness or paralysis when facing uncertainty (Grupe & Nitschke, 2013; Maier & Seligman, 2016).

On the other hand, some investors are likely to use impulsive decisions motivated by a need to take back control of the situation (Lo & Repin, 2002) in order to return to a positive

emotional state (Quoidbach et al., 2010). Another frequent behavior is difficulty in accepting and managing losses. Many individual investors avoid “accepting” a loss by maintaining a losing position, not because this is a rational strategy, but because the emotional pain associated with accepting the loss is too great. This attitude sometimes extends disadvantageous situations, in contradiction with the principles of optimal portfolio management.

These behaviors should be viewed as expressions of fundamental psychological mechanisms underlying human decision-making. In an emotionally charged environment such as the stock markets, they reveal how individuals deal, often with difficulty, with their emotions, biases and a rationality that is sometimes challenged by the decision-making context.

3. Selected Methodological Perspective and Data Collection

3.1. Selected General Methodological Perspective

We have chosen to follow a qualitative research perspective, which is rarely used in the field of finance. Qualitative methodologies are a key part of social science research, offering a deep understanding of human experiences, behaviors, and perceptions. Unlike quantitative approaches that focus on numbers and statistical analysis, qualitative research explores the ‘why’ and ‘how’ (Elo & Kyngäs, 2008). It is about studying complex phenomena in their natural environment. Researchers using qualitative methods aim at discovering underlying meanings, patterns and categories from unstructured data such as interviews, observations and textual analysis (Hsieh & Shannon, 2005). A key feature of qualitative research is its inductive perspective. Rather than testing a pre-existing hypothesis, the inductive perspective builds theories from the data : in other words, a bottom-up approach, allowing ideas and patterns to emerge from the information collected. The inductive perspective focuses on exploration and flexibility, ensuring that the research reflects the experiences of the participants, rather than forcing a rigid format (Maykut & Morehouse, 1994). The inductive approach emphasizes the nature of knowledge as something that emerges, making it particularly powerful for exploring new or under-studied areas (Bendassolli, 2013).

Regarding sample size, qualitative research does not aim at generalizing statistically to a larger population (Morse, 2000). Its goal is to gain a deep understanding of a phenomenon, explore lived experiences, identify emerging themes, and build a nuanced understanding (Sandelowski, 1995). To this end, data density takes precedence over data quantity. A small number of participants provides detailed information about each individual. A small sample also gives the opportunity to spend more time with each participant, build trust, and explore nuances, contradictions, and complexities that quantitative methods would not be able to detect. Qualitative research is an iterative process where data collection and analysis happen in parallel. The questions and the perspective followed are often adjusted as new themes arise. A small sample provides the flexibility to adapt and explore new avenues of research as the study progresses (Guest et al., 2006). The validity of a qualitative study with a small sample does not

depend on its statistical representativeness, but on the density and depth of the information collected, the rigor of the analysis, and the ability to generate meaningful insights.

In our study, for the emotions taken into consideration, the Harmon-Jones et al. (2016) classification was first chosen, with adjustments made to achieve more pronounced polarities for surprise and anticipation: anger, fear, sadness, disgust, anticipation (positive or negative), happiness, surprise (bad or good) and optimism. It should be noted that, based on the analyses carried out, we have, secondly, extended the scope of the classifications to consider emotional patterns (such as regret, resignation or abandonment) that were not noticeable in the initial classification selected (Kross & Ayduk, 2011 ; Qin, 2015 ; Frydman & Camerer, 2016).

For biases, we consider availability bias (the inclination of individual investors to rely on readily available information without conducting additional research, Sadi et al., 2011), overconfidence (individuals may overestimate their skills and have an overoptimistic view of their abilities, Wang, 2023), anchoring bias (individual investors make decisions based solely on a specific reference or piece of information, Sharma & Firoz, 2020), herd behavior (individuals follow the general market trend, Utari et al., 2024) and prospect theory (a loss has a greater emotional impact than an equivalent gain, Summers & Duxbury, 2012), including loss aversion (the tendency of individual investors to be reluctant to sell losing positions, Padmavathy, 2024) and the disposition effect (individuals prefer to sell a winning position immediately and hold on to losing positions in the hope that the stock market trend will reverse, Cheun & Rogut, 2024).

3.2. Selected Qualitative Methodological Tools and Data Collection

In order to collect participants' direct experiences and perceptions following the simulation, two qualitative methods were selected.

- Individual semi-structured interviews: semi-structured interviews were conducted immediately after the simulation by a single researcher with no academic ties to the participants to guarantee open responses (see Tabe 2). The interviews were organized using a guide containing open-ended questions on topics related to biases (four questions on availability bias, four questions on overconfidence, three questions on anchoring bias, three questions on herd behavior and three questions on perspective theory, including loss aversion and the disposition effect) and emotions (one question on emotions in general, three questions on emotional changes, four questions on the impact of emotions on decision-making, four questions on reactions to gains or losses, and five questions on emotion management).

Semi-structured interviews provide significant flexibility in terms of tailoring the interview to the context being analyzed and building trust with the participant (Longhurst, 2009). Follow-up questions and further exploration also help to understand the underlying motivations behind behaviors. Depending on the degree of freedom in the discussion, new topics may arise, opening up avenues for future research (Oliveira, 2022).

- Focus Group : Focus Group generates context-specific data by collecting different perspectives on a common issue. Some authors (Kitzinger et al., 2004 and Markova, 2003) relate focus groups to the psycho-sociological theory of social representations, considering them to be '*miniature thinking societies'*. They can be used to analyze how social representations are constructed, transmitted and maintained through communication. This method has been used to address the key themes of this article (the influence of emotions, cognitive biases, and investment decisions). The focus group was organized with all participants at the end of the three days of trading. Participants were asked to express the importance they attached to each of the themes selected, and additional questions were asked to collect their feelings. This type of discussion was designed to encourage them to pay attention and explain their differences of opinion. Focus Group provides insight into social norms (Morgan, 1997), power dynamics and collective decision-making processes that are often difficult to identify in face-to-face interviews. Focus groups are particularly effective for exploring how participants experienced the stock market simulation, by taking advantage of spontaneous discussions.

As with the individual interviews, the focus group discussions were recorded (with the participants' consent) and fully transcribed.

For both semi-structured interviews and focus groups, data analysis was carried out using a dual coding process, the first using Taguette (a free analysis tool) and the second using Maxqda (a paid analysis tool offering more advanced features). The researchers focused on the main emotional factors and biases shaping individual investors' investment decisions. The use of two separate tools facilitated comparison of results and adjustment of the themes and codes identified, thereby reducing the risk of individual bias and strengthening the robustness of the analysis. In addition, an analysis based on careful reading of the data from the semi-structured interviews and focus group was also carried out. The idea is that, even though software can provide an "objective" analysis of information, it has not – in a human perspective – been involved in the experiment.

The mixed use of a focus group and semi-structured interviews provides a research perspective to reduce the weakness of a small sample size (Creswell & Miller, 2000). By collecting data from two methods (group interactions and individual stories), it can help with:

- Validation of results: the conclusions of the focus group can be validated and explored further in individual interviews, and vice versa. If similar themes or ideas emerge in both contexts, it reinforces the validity of the conclusions, despite the small sample size.
- The identification of nuances: differences between what participants express in a group and when they are alone can reveal nuances that a single method would not be able to detect.

- Elimination of shortcomings: issues that are difficult to address in a focus group (e.g., highly personal experiences or divergent opinions) can be explored in individual interviews. Conversely, focus groups can generate a 'synergy effect' that stimulates ideas that individuals would not necessarily have expressed in the absence of others.

To report our findings, we conducted a thematic analysis following the procedure proposed by Braun and Clarke (2006):

- Becoming familiar with the data: in complement to the two analysis software programs, repeatedly reading the statements of each participant's interviews provided an overall understanding of the narratives and an opportunity to begin to note initial ideas about the emotions and biases identified in the context of this article.
- Generation of initial codes: interviews were then coded line by line, assigning codes to specific manifestations of emotions and biases. This step was used to break down the discourse into units of meaning relevant to the analysis.
- Research themes: relevant codes were then regrouped to create themes. This phase involved aggregating and organizing the codes to identify recurring central themes.
- Final report produced participant by participant: finally, the analysis was written, explaining the dynamics of each emotion and bias as highlighted through the thematic analysis, illustrating key points with statements.

4. Experimental Protocol

4.1. Participants in the Study

The experience was conducted with a sample of eight students[1] registered in management sciences at the University of Mons (Belgium). The sample size (eight participants, including seven men and one woman) was driven by budget constraints and the intensive nature of qualitative data analysis. The over-representation of men in this type of experiment has been widely discussed in the financial literature (Barber & Odean, 2001; Cueva & Rustichini, 2015; Bashir et al., 2013).

Although using student samples is sometimes questioned because of a potential psychological difference with professional traders (Harrison & List, 2014; Alevy et al., 2022), this choice is widely justified and accepted in experimental finance (Abbink &

[1] All participants provided written informed consent prior to participating in the study. Consent was obtained using printed documents, in accordance with ethical guidelines for research involving human participants. Although the experiment was conducted on a student population (all students were over 18 years of age), no manipulation was carried out: in practical terms, they remained seated in front of a computer for several hours without any physical interaction with the organizers. Finally, no intrusive technology was used, and no neurophysiological measurement tools were used. For all these reasons, how the experiment was designed does not fall within the scope of the Helsinki guidelines. Helsinki guidelines concern medical research involving human participants, but in our case, this is not medical research but simply using written documents.

Rockenbach, 2006; Fréchette, 2011). Participants followed courses in finance, providing them with basic financial knowledge, and empirical research suggests that students can express behavioral patterns and judgment skills similar to professional traders for some tasks. As previously said, we restricted the experiment to three days and the sample to eight people due to financial constraints (the students were paid). Moreover, the coordination and organization of a focus group did not allow us to increase the sample size. The literature indicates that focus groups generally consist of 6 to 10 participants (Morgan, 1997).

4.2. Organisation of the Experiment

Participants got involved in an individual trading simulation on the 'ABC Bourse' platform. The simulation was based on the French CAC40 stock market index, which the participants were familiar with. Each student was given a virtual portfolio worth €100,000 that they could use to buy or sell shares in companies included in the selected index. The experiment took place over three consecutive days (from 27 to 29 January 2025), divided into twelve one-hour sessions (no limits were set on the volume or number of transactions). To simulate real market pressure, participants had access to real-time data on the performance of their peers. A non-monetary incentive (a hotel stay worth €200 for the best-performing portfolio at the end of the experiment) was also offered to increase motivation and commitment, in addition to direct compensation (remuneration) for time spent.

4.3. Stock Market Conditions During the Three-Day Experience

The experiment took place in a market environment characterized by a slight downward trend in the CAC40 (see Table 1) and marked by some negative news events (news on DeepSeek, LVMH results, announcement by the Federal Reserve).

Table 1. Change in Reference Index Over the Three Days

Index	01.27.2025	01.28.2025	01.29.2025	Total Change
CAC40	-0.0003	-0.00012	-0.0032	-0.0036

Market conditions were experienced very negatively by participants. Even though the stock market was in a bearish configuration, the losses recorded were quite low. In other words, some companies were not affected by the downward trend. The students' perception of a structurally very negative market could be potentially explained by their high expectations and the (false) belief that stock markets are places where significant financial gains could be systematically made.

This perceived bearish context was likely to amplify negative emotions, especially the fear of financial losses and frustration caused by pessimistic signals from the stock markets. Such an environment is also favorable to the activation of specific biases such as loss aversion and the disposition effect. The decisions taken by participants cannot be analyzed without considering the perceived bearish climate that prevailed during the

experiment, a significant factor influencing risk perception, the financial strategies selected and the process of information assimilation.

5. Results from Semi-Structured Interviews and Focus Group

As mentioned above, the results are presented according to three main themes (emotions, biases and decision-making), codes (types of emotion, types of bias and decision-making orientation, in bold in the text), with illustrative statements underlying each theme and code, distinguishing between semi-structured interviews (SSI) and focus group (FG) (see Table 3).

Table 2. Statistical Summary of Semi-Structured Interviews

Student	Duration	Number of Words	Number of Pages
I.1.	42 minutes	4466	10
I.2.	42 minutes	6827	12
I.3.	59 minutes	7922	14
I.4.	43 minutes	7492	12
I.5.	42 minutes	5949	12
I.6.	36 minutes	6124	11
I.7.	36 minutes	5946	11
I.8.	33 minutes	5577	10
Mean	42 minutes	6288	11,5
Maximum	59 minutes	7922	14
Minimum	33 minutes	4466	10
Standard Deviation	8	1102	1,3

Table 3. Thematic Analysis of Semi-Structured Interviews and Focus Group.

	Emotions	Biases	Decision-Making Process
I.1	Emotions were strongly linked to stock market performance, fluctuating between **happiness** (code 1) and **disappointment** (code 2). He said: 'Our mood depended on the stock market and the shares we had bought. If they went up, we were happy; if they went down, we were a little disappointed.' (SSI) "When we made a profit, we felt happiness, satisfaction and pride." (FG) "Whether we made a profit or a loss, I still felt anxious." (FG)	A strong **loss aversion** (code 1) was present, perceiving virtual losses as real: 'This feeling eats away at us. We ask ourselves: "Could I have done better? Did I make the right choice? What if…?"' (SSI) 'We say to ourselves it's just a simulation. But inside, it's not just a simulation, because we want to perform, we want to be the best. And it's that feeling, that desire, that drives us.' (SSI).	Faced with losses, the student chose to **cut his losses** (code 1) by closing his positions and adopting a resigned attitude: 'I bought shares at the very beginning and then I saw that they weren't moving much because the market was down. Then I saw that we were losing money, so I cut my losses.' (SSI) 'We decided to cut our losses and go into passive mode. And we'll see if we can do anything else.' (SSI)

	"The next day, I felt anxious and afraid. Because I thought, that's it, it's over, there's nothing I can do now." (FG)		
I.2	The student experienced **fear** turning into **anxiety** (code 1a) in response to the continuing market decline and uncertainty: "When the markets started to fall and it didn't stop, I felt real anxiety. I thought it was never-ending, that I didn't know where it would stop. It was completely unknown and it paralyzed me." (SSI) **Fear** turned into **frustration** and a feeling of helplessness (code 1b) also emerged: 'It was extremely frustrating to see my strategies not working while the market kept falling. I felt like I was fighting a wall, unable to do anything.' (SSI)	A pronounced **loss aversion** (code 1) prevented him from reducing his positions in the hope of a rebound: 'When I saw the losses mounting on my positions, I found it very difficult to reduce them. I kept waiting for a rebound, even when all the signs were pointing to a fall.' It was unbearable to accept the loss, even though I knew it was only virtual.' (SSI) **Confirmation bias** (code 2) is evident in the search for positive information to validate hopes of a recovery: 'I started looking for articles and analysts who said the market was going to rebound, even though the majority said the opposite. I wanted it to go back up so badly that I clung to every little bit of positive news.' (SSI) 'If I see something that confirms my idea, I think that news will have a certain impact, and if I see other news that confirms it, it will have a confirmation bias." (FG)	His reaction was **decision paralysis** (code 1): 'There were times when I just couldn't look at my portfolio for hours. I didn't know what to do, I was overwhelmed, so I did nothing. I hoped it would sort itself out.' (SSI) and **impulsive decision-making** (code 2) or 'revenge' strategies after big losses: 'After a big loss, I would sometimes make very quick moves, without really thinking, just to try to recoup a little. It was impulsive, I knew it wasn't the right approach, but I was so angry.' (SSI)
I.3	Being at the top of the rankings generated feelings of **happiness** (code 1) and satisfaction: "I was in first place. It was quite a thrill. What's more, I knew I was going to win, but I also knew I was taking a big risk because I was already in first place on	A strong **loss aversion** (code 1) and a belief that prices always come back led him to hold on to losing positions: 'I didn't want to cut my losses. I don't really like that. Because for me, the price always comes back.' (SSI)	The student was caught in a vicious cycle of **impulsive decision-making** (code 1) and "revenge," taking more risks after losses: "Then you try to take more risks. And you try to get revenge. And then it's even worse. It's a

	the second day, and I said to myself, either I cut everything out and stay in first place, or I go for it. But I took the risk because of my ego.‘ (SSI) He also expressed **fear** (code 2): ’I even dreamed that my accounts were empty. It was stressful not knowing where things were going." (SSI)	and ‘But anyway, in three days, there was little chance that the price would return to its previous level, but I still hoped it would. That's what you shouldn't do, hope.’ (SSI) **Overconfidence** (code 2) linked to his ego and initial performance encouraged him to maintain a high-risk stance: ‘I remain convinced that I have to take this risk and that if I've done it, I'll continue to do so until the end.’ (SSI) ‘It's important not to be self-deprecating, to be confident, and to take mitigated risks.’ (FG)	vicious cycle, it's a never-ending cycle. (SSI) He admitted that he mismanaged the size of his positions, leading to accelerated losses: “Or sometimes I get the position size wrong. Then the market moves 10 times faster. And it's very difficult, because it's really strange. I mean, the blood rushes to your head. You think, ‘Oh, what am I doing?’” (SSI) Confirmation bias led him to reinforce his winning positions: “And often, when I get my confirmations, I get back into the position to increase the risk a little bit, and the risk paid off because I went up to 4%, I think.” (SSI)
I.4	The student began with **optimism** and motivation (code 1): “I have a week off, so there's no reason I can't do this. Instead of staying at home or doing something else, why not do this during the week?” (SSI) The inactivity of the market quickly turned into **fear** (code 2), frustration, helplessness, and a lack of motivation: “But nothing was happening. So we lost motivation.” and “We were there. Disappointed.” (SSI)	An **anchoring bias** (code 1) was observed, with disappointment arising when the situation did not improve despite initial investment: “I tell myself that there's nothing more to be done, because it's the last day, and you've seen the stock market, there's going to be no miracle.” (SSI) “I would prefer to anchor myself to something I know, such as indicators, because I believe they slightly improve performance. In the end, it was the only thing I could base my decision on.” (FG)	Emotions and bias led to **decision paralysis** (code 1) and resignation, with the student feeling that there was nothing left to do in the absence of a market miracle: “We realized that, well, there was nothing else we could do.” (SSI)
I.5	The student experienced **fear** (code 1) of losing his money, even if it was virtual, which he found “frustrating”: "The moment that struck me the most was at the very end, at	A **confirmation bias** (code 1) drove him to look for signs of recovery on the charts: “I was trying to look at the charts all the time to see if there was a chance it would	**Impulsive decision-making** (code 1) (about sales) His decisions were focused on selling to limit losses: “I was more interested in selling than buying.” (SSI)

	the end of the third day, when we got the rankings and saw what we had lost, even if it wasn't real money. It's still pretty frustrating to see that you've lost so much money.“ ”I still felt a little stressed when I was making transactions, when I was buying or selling, because I was afraid of losing my money, even if it wasn't real money." (SSI). He also had trouble adapting to the bear market: “It's true that the market was down. So I had a little trouble adapting.” (SSI) “I was already desperate that it could change positively all of a sudden.” (FG) “My emotions about the situation took over and encouraged me to stop doing anything. If there's something you can do, do it. But it won't be something that will change the situation much.” (FG)	go back up, if there was a small dip and then it would go back up.” (SSI) “Basically, I was following companies that I knew a little bit about, but since others were telling me that these were companies that were making big profits, I thought, why not? If it can bring me the same thing as him, but I didn't dare to put in the same amounts.” (FG) He also looked for social comfort (**herd effect**, code 2): “When I saw that I had lost quite a lot too, I told myself that it wasn’t just me and that others were also experiencing significant losses.” (SSI) He also tried to copy others (**herd effect**, code 2) “I took other people's ideas and thought I could use them to get into the same situation as them, but I didn't do it at the right time, and it had a negative impact on me.” (FG)	“I kept selling anyway, and I'm going to try to limit my losses.” and “I told myself that as I made gains, I would sell again.” (FG) “On the one hand, because I've taken a step back, I think it's a bit like what you said yesterday, that it's a bit screwed up and all, but hey, let's go for it, we might as well take the risk.” (FG)
I.6	A strong emotion of **disappointment** (code 1) was reported when moving from first to last place: “It was disappointing because... Actually, on the first day, I was in first place. So I was very happy and very motivated.” (SSI) and “And then I saw that I had dropped down anyway. It was disappointing. From first to last. Yes. That was the disappointment.” (SSI) He maintained **optimism** (code 2) despite the losses: "Up until then, you said to	The **anchoring bias** (code 1) on initial performance (being first) made the downfall even harder to deal with: “At that point, I thought, ‘Oh my gosh, I shouldn't have invested so much in companies that were... well, that were underperforming.’ So that was like a letdown. I was disappointed.” (SSI)	Disappointment was followed by **decision paralysis** (code 1) and resignation, with the student eventually “deleting” everything from his portfolio: “So it was just small gains and small losses. And that's why, in the end, I realized it wasn't working, so I deleted everything.” I preferred to just leave it empty.“ (SSI) ”At the last minute, you say to yourself, ‘There's no point anymore.’ Yes, at that point, I was actually 3% away from finishing, it wasn't possible." (SSI)

	yourself, 'Come on, I believe in it, I hope things will change.' When there was a small gap, like 1% or 1.5%, I said to myself that with a lot of luck, it could work out, but at that point, I knew it wasn't possible." (SSI) "And so I said to myself that it's true that you have to take risks, and so the desire to be first, let's say, had an impact on decision-making." (FG)		
I.7	The student expressed **fear** (code 1) of losing and intense stress: "A lot of stress. I felt a little stressed because if the share price went up, it was okay. If it went down, I felt a little stressed." and "I was afraid of losing. Even though it was only virtual money, I was still afraid of losing it." (SSI) "When you're losing, you don't want to sell, you don't want to validate a loss." (FG) "I tend to hold on to my position rather than take risks and sell and try something else." (FG)	Even if biases were not noticeable, the **absence of emotional regulation** was noted: "No, I didn't do anything to manage my stress. I don't know how you can manage it in real life. But no, I didn't do anything." (SSI) "Emotions are not necessarily known. It wasn't instantaneous. I didn't even know to what degree. It was more or less precise." (FG)	Fear prompted him to make **impulsive decisions** (code 1) (sales) to cut his losses, rather than wait for a rebound: "I was afraid of losing more. So I said to myself, 'I'm just going to stop.' So I think when it [the stock] started to fall, I sold it right away. Instead of waiting for it to go up again". (SSI)
I.8	The student quickly experienced **fear** (code 1a), which turned into **frustration** and a feeling of not being "good enough" compared to the other participants: "Right away, I quickly felt, how can I put it, that I wasn't up to the task. I felt left behind compared to the others, because they had already participated in scholarship competitions or were trading on their own, so they were talking about things, but I thought to myself, we didn't	A strong **loss aversion** (code 1) caused him to hesitate about what decision to make: "I didn't really know when to sell, whether to sell now or wait for the market to recover." (FG). The participant then quickly cut his positions: "So I cut everything because I thought, no, this isn't possible." (SSI) "I decided to cut my losses at the end because I	His frustration led to **decision-making paralysis** (code 1) facing a market he considered hopeless: "The market is still bearish, there's no point in trying anything." and "On the afternoon of the third day, yes. Because there comes a point when you say to yourself, the market is down, there's no point in trying anything." (SSI)

take the same classes, it's not possible." (SSI) "When I was winning, I knew very well that it was just pure luck." (FG) His **fear** (code 1b) turned into abandonment and **resignation**: "Complete abandonment." and "In the end, I told myself it was a lost cause." (SSI)	thought, after doing some research, that it was better to cut your losses than let them fall indefinitely." (SSI). He noted that the feeling of loss is twice as strong as that of gain: "But I read that when you lose something, you suffer a loss, and the feeling you get is twice as strong as a gain. I think that's what I took away from that book." (SSI). This passage shows a search for information to understand the phenomenon of loss.	

6. Results Analysis

6.1. The Role of Emotions

Emotional reactions connected to market performance and virtual portfolio performance were identified. The majority of participants experienced negative emotions (fear or disappointment) in response to financial losses, with these emotions evolving in response to market uncertainty: market uncertainty triggered many emotional responses, which evolved to a greater or lesser extent over the course of the experiment:

- From fear to paralyzing anxiety: initially, the continuous decline of the markets generated an underlying fear. Gradually, this fear intensified into deep and persistent anxiety. As one participant explained, "*When the markets started to fall and it didn't stop, I felt real anxiety. I thought it would never end, that I didn't know where it would stop. It was total uncertainty and it paralyzed me*.' And *'When I left for my break or shut down my computer, I felt anxious and fearful about the next day*." For one participant, this anxiety was so prevalent that it interfered with his dreams, causing nightmares about empty wallets, highlighting the distress he felt.
- From fear to frustration and growing powerlessness: as time went by, fear also turned into frustration, leading to a feeling of powerlessness. As a result, the strategies put in place became less and less effective as prices continued to fall, sometimes leading to desperate moves. '*It was extremely frustrating to see my strategies not working while the market continued to fall. I felt like I was fighting against a wall, unable to do anything,'* said one participant, even referring to '*complete resignation'* or paralysis in response to the situation.
- From disappointment to progressive demotivation: initial hopes gradually evaporated, replaced by growing disappointment. This disappointment gave rise to a general lack of motivation. Participants became stuck in a kind of stagnation,

where '*Nothing was happening. So we lost motivation*,' reflecting the gradual decline in their initial commitment in the absence of positive results.

- From (early) happiness (satisfaction) to overconfidence: At first, success could bring positive emotions and a feeling of pride. '*I was number one. It felt pretty good*.' But pride could be a risk factor: '*I took the risk because of my pride.' The desire to be first 'affected decision-making*.'

6.2. Cognitive Biases at Work

Emotions influenced judgment through the following biases:

- Loss aversion (related to the disposition effect and prospect theory): the fear of losing money (even virtual money) was a key finding. '*I'm losing £1,000 here, and even though it's not real money, it's like it is*.'The difficulty of accepting a loss was also noticeable: '*When I saw the losses piling up on my positions, I found it extremely hard to cut them. I was always waiting for a rebound, even when all the signs were red. It was unbearable to realise the loss, even though I knew it was only virtual*.' One participant even noted: '*When you're losing, you don't want to sell, you don't want to validate a loss*.'
- Anchoring bias: initial positive performance was used as a reference point. '*On the first day, I was in first place. So I was very happy and very motivated*.' Participants became anchored to familiar reference points: '*I would prefer to anchor myself to something I knew, so technical indicators*."
- Confirmation bias: Due to uncertainty, some sought to validate their own assumptions. "*I started looking for articles and analysts who said that the market was going to recover... I wanted it to recover so badly that I clung to every little bit of good news*.' One participant said: '*When I found a piece of information that supported my view, I magnified it. On the other hand, if it was bad news, I minimized it or dismissed it as irrelevant*."
- Overconfidence: early successes reinforced egos, leading to an underestimation of risks. '*I said no, I'm going to keep going, I'm doing fine.' "I think confidence is something that boosts your decision-making. As a result, you're more optimistic, you have more confidence in yourself...' 'Even if I get a negative result, I remain optimistic. Because if I start trying to get revenge, that's the hardest part."*
- Familiarity bias: participants were inclined to select companies they were familiar with, thereby limiting diversification. "*If I have two companies, for example, both in the luxury sector, I might be more inclined to choose the one I am unconsciously familiar with. Because I know it in my head, it has an image of solidity, for example*.' *'It's true that when I know the name of the company, I tend to be interested in it. It's not going to influence whether or not I invest in the company. I'm more likely to lean towards a name I know and am familiar with than a name that is completely abstract to me."*
- Herd behavior under social influence: Real-time ranking created a dynamic of social comparison. *'It feels a bit like you're being watched. Everyone can see what you're doing or what you've got.' When faced with losses, the feeling of not being alone was comforting: "We said to ourselves, we're not the only ones. That's it. OK.*

So being in a group makes you feel better.' 'When I saw that I had also lost quite a lot, I told myself that it wasn't just me and that others were also suffering significant losses.' 'Talking about it helps to reduce emotions and we can compare ourselves with others." In the semi-structured interviews, we also noticed that students did not necessarily speak on their own behalf, but on behalf of the group (some used "we" rather than "I").

6.3. Impact on Decision-Making

The relationship between emotions and biases influenced decisions and the development of not necessarily relevant strategies:

- Decision-making paralysis, apathy and resignation: Faced with powerlessness, many students have withdrawn. '*Faced with the decline, I was paralyzed. I didn't sell, I didn't buy, I was just in "wait and see" mode. It's terrible to feel incapable of making a decision.*' The feeling that '*there was no point in trying anything*' led to '*doing nothing*' or '*cutting everything off*' and '*leaving your wallet empty*' (in other words, containing only cash).
- Loss management: The management of losing positions was strongly influenced by loss aversion. While some '*cut their losses quickly*,' saying, '*I cut right away because I thought, no, this isn't possible,'* others *'refused to cut their positions, hoping for a rebound.'*
- Impulsive decision-making and a desire for 'revenge': Frustration sometimes resulted in irrational decisions. "*After a big loss, I would sometimes make very quick moves, without really thinking, just to try and get some of it back. It was impulsive, I knew it wasn't the right approach, but I was so angry*." One participant described this as a '*vicious circle, an endless cycle'.*
- Persistence with inappropriate strategies: Anchoring to initial performance and overconfidence prevented some from adjusting their strategy despite bearish signals. '*I remain convinced that I need to take this risk, and if I've taken it, I'm going to stick with it until the end. That's it. OK.' So you're sticking with this risk until the end, even though I know it could hurt me.' And 'In all situations, I tend to hold my position rather than take risks and sell and try something else*."

It should be noted that, in most cases, emotions induce biases which, in turn, result in specific decision-making patterns (for example, fear leads to loss aversion, which results in decision-making paralysis). However, in some cases, some emotions directly influence decision-making processes without passing through biases. The more intense the emotion, the more direct its influence on decision-making. This finding may call into question the real issue of bias on decision-making and could refocus the debate solely on the emotional influence on decision-making, particularly in strongly bullish or bearish contexts.

7. Conclusion

The results from both methodological tools offer an insight into how emotions or/and biases shape traders' investment decisions. Both analyses were based on a qualitative

methodology, which is relatively underused in finance but essential for understanding the complexity and emotional dimensions of decision-making processes. They were based on a three-day trading simulation on the French stock market (CAC40), with virtual portfolios. The participants were a group of eight management science students from the University of Mons (Belgium). The market trend was slightly bearish (but perceived as very negative and, in all cases, perceived as a cause of disappointment and disillusionment), with information negatively affecting the stock market index, a situation that amplified negative emotions. Data was collected through semi-structured interviews and a focus group, allowing for an in-depth exploration of the individual experiences.

A key finding across both studies is that emotions aren't just passive reactions, but forces that influence judgment and decisions. In a bear market, negative emotions have had a strong impact.

- Fear, which turned into anxiety due to uncertainty and loss, was experienced intensely.
- Frustration, discouragement and powerlessness resulted from a perceived inability to take effective action or find strategies that were working.

Although they were less common, positive emotions (such as happiness after an initial positive trade) were also found: these could make some of them overconfident. In all cases, managing emotions emerged as a ‘major obstacle’ and a ‘necessity’ for effective decision-making, with participants realizing that ‘emotions are not good friends in trading’.

Emotional patterns contributed to the development and reinforcement of the following biases:

- Loss aversion (related to disposition effect and prospect theory) was strong, with students viewing losses as real even though they were only virtual. The emotional pain of ‘accepting the loss’ or the fear of losing more made them hesitant and reluctant to cut losing positions, often resulting in paralysis in the hope of a rebound.
- Anchoring bias became evident in the attachment to initial positive emotions associated with good performance in the first trades. The subsequent fall in the rankings was followed by disappointment and demotivation, making it challenging to adjust expectations to market reality.
- Confirmation bias arose when students, due to uncertainty and powerlessness, actively searched for information that validated their hopes for a market recovery, even when fundamentals were negative.
- Overconfidence, due to ego and satisfaction of early success, caused some to underestimate the risks of the bear market and persist with inappropriate strategies, or even ‘increase the risk’ taken.

Other biases were identified but were less well documented by participants: familiarity bias (focusing on well-known companies and limiting diversification), the use of

heuristics (relying on intuition because of a lack of financial knowledge), and availability bias (relying on easily available information).

The interaction between emotions and biases had direct consequences on trading decisions:

- Decision-making paralysis and resignation were common behavioral responses to feelings of powerlessness. Some participants even preferred to 'leave their wallet empty' (only cash) or 'avoid looking at it for hours'.
- Loss management was strongly influenced by loss aversion, leading either to quick cuts to avoid emotional pain or, more often, to a reluctance to accept losses in the hope of a rebound, thereby increasing losses.
- Impulsive decision-making and the desire for 'revenge' on the market, explained by intense frustration and feelings of anger, prompted some to make quick decisions and take excessive risks.
- The persistence of inappropriate strategies was found in participants who were focused on their initial performance or who were overconfident, preventing them from adjusting their strategy despite the downward trend.

In addition, other factors were identified as influencing decision-making:

- The social context of the experiment had a significant impact (which could be considered as a herd effect): ranking generated social comparison between participants, influencing motivation or stress. Collaboration within the group reduced stress and facilitated information sharing. In some cases, the group was perceived as a place of comfort, capable of helping to deal with frustration and stress.
- Financial performance – indeed, unmet financial expectations - and the subsequent decline in the financial portfolio's value had a strong impact on emotional state, motivation and further decisions.

These two analyses demonstrate that staying rational in a bear market is difficult when emotions and subsequent biases are at play. Emotions often overcome rational analysis, leading to some cognitive biases and to paralysis in decision-making, impulsiveness or the persistence of irrelevant strategies. More fundamentally, the findings of the two studies are consistent with behavioral finance, moving from the traditional view of investors as "purely" rational agents. Our results demonstrate that emotions and cognitive biases (alone or connected) are key components of decision-making processes, particularly in a bear market.

8. Further Research Avenues

- Quantitative validation of the biases and emotional responses observed: further research could involve using quantitative methods to measure emotions (e.g. via physiological indicators such as heart rate during market movements). It would also be useful to quantify the extent of specific biases (such as loss aversion or anchoring bias) using controlled experimental tasks. The objective is to provide

statistical validation of the connections identified between emotions, biases and decisions.

- Comparison between different market environments (bullish vs. bearish/volatile): our analysis focused on a bearish market environment, where negative emotions were predominantly present. The research could compare emotions, biases and decisions in other environments (bullish, stable or highly volatile). This would make it possible to analyze the extent to which emotional dimensions influence investor behavior, providing a detailed understanding of the influence of the market context.
- Comparing students and experienced traders: the participants in the study were students; most were beginners in this type of simulation. Their reactions (such as 'paralysis' or 'resignation') may differ from more experienced traders who have developed emotion management strategies. Comparing the psychological dynamics and decisions of novice and experienced traders in a bear market would provide insights into learning and emotional adaptation in the field of stock market investing.
- Influence of social context and group dynamics: the study showed that the search for 'collective comfort' and social comparison via ranking played a role for some students. A further avenue of research would therefore be to study the influence of group versus individual trading on emotions, biases and decisions.

9. Competing Interests Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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