
EVALUATION OF INVESTOR BEHAVIOR: DO INVESTORS RESPECT THEIR OWN LIMITS?

Robson Braga¹

Gerlando Augusto Sampaio Franco de Lima²

Márcia Martins Mendes De Luca³

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ABSTRACT

In this quasi-experimental study we evaluated the effect of heuristics on financial decision making in order to detect signs of non-rational behavior. At baseline, the participants (=investors) established an anchor percentage value of satisfactory gains and tolerable losses on investment in stock and defined their self-perceived investor profile, but most investors eventually manifested a more aggressive profile, exceeding their own limits considerably. By applying statistics to our findings (Student's t test and chi-square), we found that, due to analytical biases, overconfidence or unrealistic optimism, investors did not respect their own limits but rather attempted to obtain gains above the initial anchor values. In addition, experiencing a situation of gain or risk did not make a significant difference in the degree of risk the investors were willing to take subsequently, making them accept losses beyond what they initially considered tolerable. Thus, our findings contradict the assumptions of the expected utility hypothesis and the principle of agent rationality.

Key words: Decision Making. Behavioral Accounting and Finance. Heuristics.

1 INTRODUCTION

Financial decision making was for a long time considered an entirely rational process. Investors were believed to be able to evaluate contexts and variables competently and make optimal decisions. However, with the growing recognition of the influence of behavioral factors in business, the assumption of perfect rationality has come into question.

¹ Doutorando em Controladoria e Contabilidade pela Universidade de São Paulo (USP) - Professor da Universidade do Estado da Bahia (UNEB). Endereço: Av. Guanabara, 3950, Doutor Gusmão, 45821-470 – Eunápolis - BA. E-mail: rbraga@uneb.br. Telefones: 55 (73) 8109-5995; (11) 95359-6339.

² Livre-Docente e Prof. Associado no Departamento de Contabilidade da FEA/USP – Pós-Doutor em Contabilidade pela UIUC/Illinois. Endereço: Av. Prof. Luciano Gualberto, 908, Butantã, São Paulo - SP, 05508-010. E-mail: gerlando@usp.br. Telefone: 55 (11) 3091-5920.

³ Doutora em Controladoria e Contabilidade pela Universidade de São Paulo (USP) - Professora da Universidade Federal do Ceará – UFC. Endereço: Av. da Universidade, 2431, Benfica, 60020-180 – Fortaleza - CE. E-mail: marciadeluca@ufc.br. Telefones: 55 (85) 3366-7802; 55 (85) 86148899.

Following the publication of the seminal studies of Daniel Kahneman and Amos Tversky (TVERSKY and KAHNEMAN, 1974; KAHNEMAN and TVERSKY, 1979), much research has been done on the heuristics and cognitive biases affecting finances and accounting in order to understand the judgment and decision-making processes in these fields and in related areas, such as economics, education, political science and engineering.

By simplifying the process of judging and evaluating contexts and variables, heuristics render decision making more time- and cost-efficient, speeding up problem solving (Ariely, 2008). However, while facilitating decision making, heuristics can also introduce a number of analytical biases in the process (BAZERMAN and MOORE, 2008).

People tend to repeat decision behaviors when faced with situations similar to what they have been exposed to previously, especially if the first results were positive (BAZERMAN and MOORE, 2008). This type of behavior is referred to as a "shortcut". Shortcuts are common in many different decision contexts, particularly in the insurance business (HSEE and KUNREUTHER, 2000) and the stock market (HAIGH and LIST, 2005).

In experimental studies on the heuristics of anchoring and representativeness, Kahneman and Tversky (1974) demonstrated that even experienced professionals commit mistakes as they trust wrong predictions and estimates biased by prejudice. These results were also seen in some Brazilian studies as Oliveira (2010), Lima Filho, Bruni, Sampaio, Cordeiro Filho & Carvalho Jr (2010), and Dorow, Macedo Jr, Nunes, Rossi e Maximiniano (2010).

Anchoring is based on the establishment of irrelevant hypotheses or references in the decision-making process, while representativeness involves the validation of previously formed stereotypes, frequently leading to biased decisions (BAZERMAN and MOORE, 2008). Dorow et al. (2010) realized there is some influence of the anchoring bias in the decision making by professionals in the real estate market, although they noted that the adjustment does not always occur.

Biased decision behaviors tend to make people think of themselves as more competent than they are and become overconfident (BLAVATSKYY, 2009). However, since the effect of overconfidence cannot always be demonstrated with precision and certainty (KIRCHLER and MACIEJOVSKY, 2002), much more research in this field is necessary.

Considering the existence of shortcuts and analytical biases in the decision behaviors of investors, the central question of the present study was: how do investors behave when making decisions which involve gains and losses beyond the limits they consider acceptable?

Based on this problematic and on the principle of loss aversion (KAHNEMAN and TVERSKY, 1979), our first hypothesis was that investors respect self-established anchor values for gains and losses on investments in stock. To investigate the phenomenon of representativeness heuristics and anchoring bias (KAHNEMAN and TVERSKY, 1979), our second hypothesis was that investors become more tolerant of losses after experiencing a situation of gain.

Thus, the main objective of this study was to evaluate the effect of heuristics on the decision-making process of investors operating on the stock market and investigate the existence of behaviors deviating from so-called rational standards (BAZERMAN and MOORE, 2008). To do so, we conducted a quasi-experiment designed to test whether investors respect their own limits of gains and losses.

If investors are found to respect their limits, it may be concluded that they maximize the utility of their investments, as stated by the expected utility hypothesis, protecting their assets from losses and preserving their gains. If not, their behavior would be explained by the principle of limited rationality (SIMON, 1956) and we would expect to encounter the effects of unrealistic optimism (WEINSTEIN, 1980), overconfidence and other types of bias (BAZERMAN and MOORE, 2008).

Since the pioneering work of Simon (1956), Kahneman and Tversky (1974), and Tversky and Kahneman (1979), much research has been done in the fields of behavioral and limited rationality in decision making. However, much remains to be explored and new theoretical discussions and empirical demonstrations are always welcome, whether in support of or against the current theories.

Our research efforts constitute an attempt to shed more light on financial judgment and decision-making processes in light of the debate on limited rationality and the effects of social, cognitive and emotional factors on economic decisions. The study is by no means definitive and conclusive, but intends to instigate new debates and further investigations into how investors define and make choices in the world of business.

2 THEORETICAL FRAMEWORK

Decision making involves an array of elements with varying effects on the outcome of the decision. Thus, in order to rationalize decisions, individuals process the available information and analyze their choices based on certain logic (BAZERMAN and MOORE, 2008).

Pioneered by Simon (1956), much research has been done to understand this logic, making it clear that decision making is not as rational a process as classical economists claim. According to Simon (1978), the decision-making process has three phases: the intelligence phase (problem identification and data collection), the design phase (identification and planning of alternative solutions) and the choice phase (selection of a solution from multiple alternatives).

In accordance with the expected utility hypothesis, investors' choices should reflect an unrelenting concern for utility maximization (BERNOULLI, 1954). To make the most appropriate choice, the available options must be rationalized and all the elements involved in the decision-making process taken into account (SLOVIC, FISCHHOFF and LICHTENSTEIN, 1977).

In classical economics, it is assumed that decision makers intent on utility maximization make decisions based on entirely rational processes (SLOVIC, 1995). This assumption gave rise to decision models informed by axioms that do not factor in the influence of psychological or behavioral aspects (KIRCHLER and HÖLZL, 2003).

The notion of perfect agent rationality was long prevalent in economics, until due attention was given to the study of how behaviors and cognitive limitations influence decision makers, such as in the seminal works of Simon (1955) and Tversky and Kahneman (1974).

The acceptance among finance and accounting scholars of the influence of psychological and behavioral aspects may be considered an advance in theory (BAZERMAN and MOORE, 2008; BONNER, 2008; LIBBY *et al.*, 2002). Thus, mistakes committed in the past can be explained as the result of unrealistic optimism (WEINSTEIN, 1980) or biases held by decision makers, as opposed to the explanations made possible by the framework of classical economics (BLAVATSKYY, 2009).

Following the advent of prospect theory (KAHNEMAN and TVERSKY, 1979), many empirical studies have been conducted to validate the existence of decision-making processes at odds with the principle of agent rationality required by the efficient-market hypothesis. Although classical economists admit the occasional influence of behavioral factors, they generally believe that errors caused by such elements are automatically corrected by the market.

As pointed out by Slovic (1995), the efficient-market hypothesis is called into question by the existence of non-rational decision-making behaviors. More effective discussions on limited rationality, such as those initiated by Gabaix and Laibson (2005), are needed to revise these concepts.

Optimal decision making, taking into account most variables and ongoing changes in context, requires not only cognitive and technical competence on part of the agent, but also time, effort and financial resources (GABAIX and LAIBSON, 2005). To save resources, agents often skip stages in the decision-making process which they deem well-known or irrelevant, thereby elevating the risk of making inappropriate choices and obtaining bad results. This simplification of the decision-making process is referred to as heuristics.

Building on the ideas of Tversky and Kahneman (1974), Ariely (2008) demonstrated the existence of several types of heuristics and related biases. Heuristics are simplifications of analytical processes which are already known by the agent, with the purpose of reducing the time and cost involved in repeating the entire decision-making process (BAZERMAN and MOORE, 2008).

However, simplifications of decision-making processes can lead to mistakes in data interpretation and analysis and, consequently, to different types of bias (TVERSKY and KAHNEMAN, 1974). For example, anchoring bias can make investors rely excessively on random references and inconsistent results (BAZERMAN and MOORE, 2008).

The studies from Kahneman and Tversky (1974) about biases were replicated by a lot of researchers, e.g. Silva, Lagioia, Maciel and Rodrigues (2009), and Macedo, Dantas and Oliveira (2012). The findings go to the same conclusions; the subjects make choices that are contrary to the rational grounds brought by the Expected Utility Theory and show the same typical behavior from the Limited Rationality presented by Simon (1955).

Other authors have shown that the manner in which agents perceive and judge the environment in which they make their choices indicates non-model

processes, especially with regard to the influence of relevant behavioral aspects (KAHNEMAN and TVERSKY, 1984; EPSTEIN 1994; EVANS, 1984; EVANS; OVER 1996; SLOMAN 1996).

According to Einhorn and Hogarth (1981), investors using normative decision models should be fully capable of accessing, judging and combining a large amount of information in the process of making optimal financial decisions. But pertinent evidence gathered by empirical studies, such as those of Barberis *et al.* (1998), Barberis and Thaler (2003) and Gabaix and Laibson (2005), contradicts this view.

In addition, overconfidence plays an important role in behavioral finance (De BONDT and THALER, 1985). Thus, Ariely (2008) argued that judgment biases in decision making are clearly observable and are not affected significantly as markets evolve and information is updated.

Overconfidence is even more clearly perceptible when decisions are made in settings relatively well-known to the agent, or when they involve knowledge areas in which the agent believes to be an expert or which are considered particularly difficult (SLOVIC, FISCHHOFF and LICHTENSTEIN, 1977; HEATH and TVERSKY, 1991).

Studies on the phenomenon of overconfidence have yielded diverging results. Thus, Erev, Wallsten and Budescu (1994) argue that given the same set of information and decisions, agents may express overconfidence or underconfidence depending on the method employed. This indicates the need for further studies on decision behaviors, especially in the fields of business.

The obvious influence of behavioral aspects and limited rationality on financial decision making has spurred new investigations and new theoretical propositions. To better understand the phenomenon and validate these theories, more empirical studies on behavioral accounting and finance are needed, subsidizing new discussions on judgment and decision-making processes.

3 RESEARCH DESIGN

In this study we evaluated the decision-making behavior of investors in light of the theories of limited rationality (SIMON, 1956), decision simplification (heuristics) and cognitive bias (TVERSKY and KAHNEMAN, 1974; KAHNEMAN and TVERSKY, 1979). We adopted an empirical-theoretical approach of the quasi-experimental type (SHADISH *et al.*, 2002), similar to that used by Haigh and List (2005) and Ariely (2008). In research on heuristics and bias in decision making, this approach makes it impossible to completely isolate interference from external factors and variables, much as in empirical studies in applied social sciences. However, the effect of external variables was limited since the study participants were unable to communicate or exchange information with each other, making it possible to evaluate the desired relationship between cause and effect.

The use of experimental strategies have been common in studies in the field of Behavioral Finance, both the seminal researches like Kahneman and Tversky (1974, 1979) took advantage of this proposed method. In the Brazilian context, the experiments used in the study of investment decisions often rely simulations

that put participants in an environment close to the real, as did Macedo Jr. (2003), and Oliveira (2010).

The study was quasi-experimental in that the participants were asked to act like investors on the Brazilian stock market (BM&FBOVESPA). Each would invest a thousand dollars (USD 1,000) on a given stock and, considering the subsequent fluctuation of the share prices on the Brazilian capital market, had to decide whether to sell the stock or continue with the investment.

The sample consisted of college students (n=106) from two universities in Bahia (Brazil), one governmental and one private, attending the last two semesters of accounting. The participants were randomly distributed in two groups of 53 subjects each. Although the selection of large samples is considered a challenge in experimental studies, the sample size of this study is in line with those used by Kahneman and Tversky (1974, 1979).

The choice of university students for this type of study is not without precedent. Thus, Libby *et al.* (2002), Liyanarachchi and Milne (2005) and Liyanarachchi (2007) found no significant differences between students and professional investors with regard to decision-making behavior. Likewise, to Druckman and Kam (2009), the use of students in experimental investigations can yield reliable and meaningful results.

The participants (henceforward referred to as "investors") were asked to invest in four firms ("Alpha", "Beta", "Gamma" and "Theta") belonging to different sectors (food, agribusiness, paper/cellulose and construction) and traded on BM&FBOVESPA (CVM, 2012). The firms and the average closing prices for each quarter between January 2011 and April 2012 are shown in Table 2. Share prices followed very different trends: during the investment period, two of the firms registered gains of more than 40%, while the other two firms registered losses of more than 50%.

The investors were blinded to the actual periods to which the share prices corresponded to prevent them from making correlations with market performance and business sectors, potentially influencing the decision-making process.

At baseline, the investors were shown diagrams with the results of the five quarters preceding January 2011. At this point, they were requested to make independent investments buying stock worth USD 1,000 in each of the four firms, one for each stage in the experiment. The experiment was divided into four stages of five quarters each. After each quarter, the investors were informed about the portfolio position and given the opportunity to decide whether to sell the stock or continue with the investment.

Following the sale of each stock, the gain or loss was calculated. For those continuing with the investment despite the risk of market fluctuations, the next opportunity to make a decision would be at the end of the next quarter. Finally, gains and losses were compared with the anchor values established by the investors when filling out the profile questionnaire (Table 1).

Table 1 – Profile questionnaire filled out by the participants (“investors”).

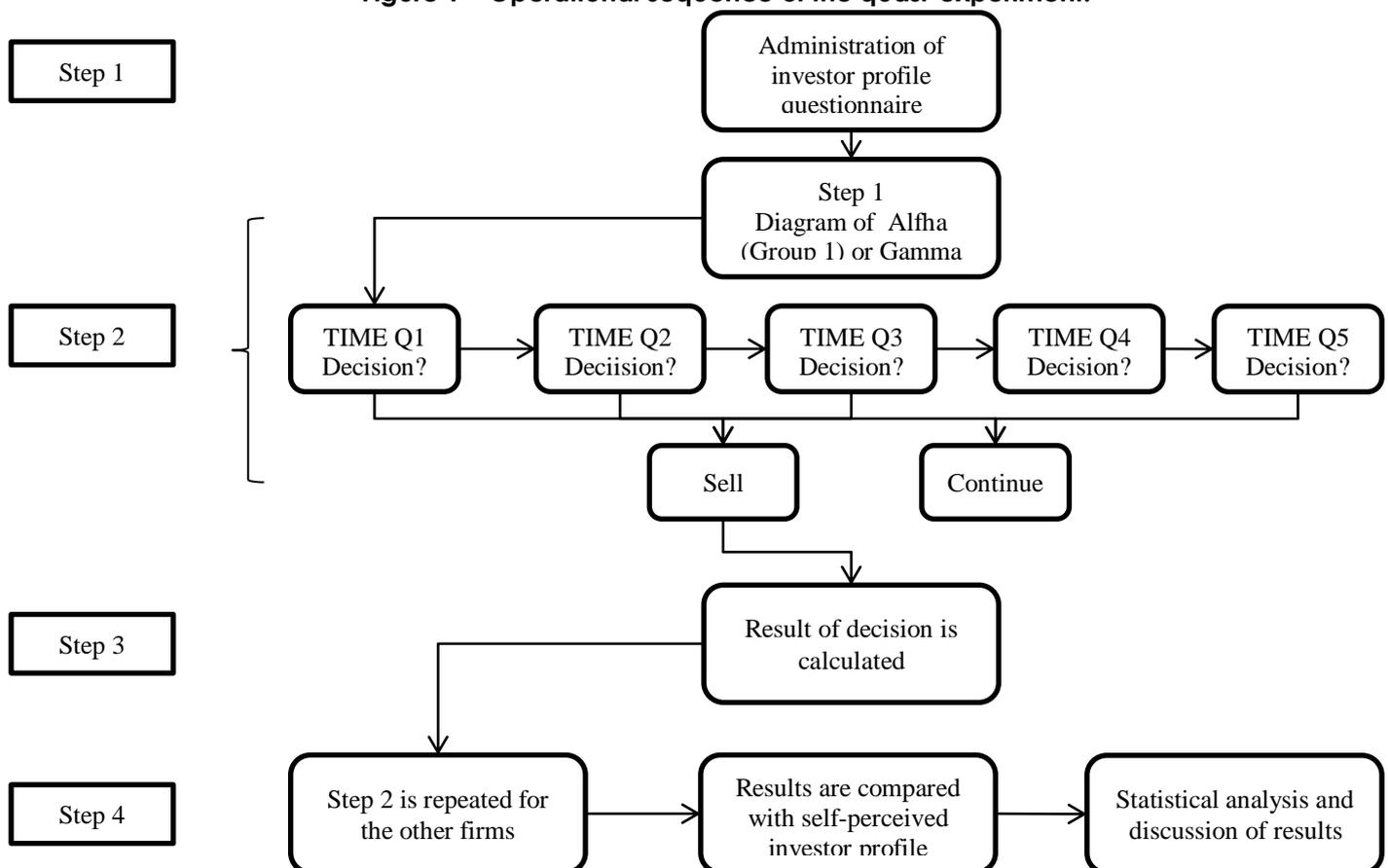
Anchor percentage values for gains	Anchor percentage values for losses
A savings account yields annual earnings of about 7% and is considered a conservative investment. What annual percentage (%) would you consider a satisfactory gain on investments in stock?	High-risk investments require a certain tolerance of losses. What is the highest percentage loss on investments in stock you would consider tolerable?
What would you do if your investment was generating gains beyond the percentage informed above?	What would you do if your investment was generating losses beyond the percentage informed above?

Source: By the authors.

Based on the concepts of risk aversion and anchoring bias (Kahneman and Tversky, 1979), the questions were designed to help the investors i) establish an anchor percentage value of satisfactory gains on investments in stock compared to the interest earned on a conventional savings account, ii) indicate their self-perceived investor profile as either aggressive (A), moderate (M) or conservative (C), and iii) establish a tolerable limit of loss on investments in stock.

Figure 1 is a flowchart of the quasi-experiment.

Figure 1 – Operational sequence of the quasi-experiment.



Source: By the authors.

Between January 2011 and April 2012 (a total of fifteen months, or five quarters), the shares of the firms labeled Alpha and Beta experienced an appreciation of 44.27% and 54.20%, respectively, while the shares of the firms

labeled Gamma and Theta experienced a depreciation of 78.72% and 64.14%, respectively. Table 2 shows the moments (quarters Q1 through Q5) at which the participants were requested to make a decision regarding their investment in each firm.

The table shows the position at the moment of decision, i.e. at the end of each quarter. For example, an investor selling Alpha stock at Q2 would suffer a loss of 0.68%, while one selling Beta stock at Q4 would gain 35.20%.

Table 2 – Portfolio position of each firm at the moment of decision.

Firm	Portfolio position in USD at quarters Q1 through Q5					
	Initial	Q1	Q2	Q3	Q4	Q5
Alpha	1,000.00	1,170.94	993.16	883.76	1,324.79	1,442.74
Beta	1,000.00	935.80	1,038.00	1,106.00	1,352.00	1,542.00
Gamma	1,000.00	1,368.79	687.94	319.15	106.38	212.77
Theta	1,000.00	928.63	649.26	441.25	389.90	358.57

Source: By the authors.

Individual diagrams showing the portfolio position of each firm and quarter were made available to the investors, giving them the opportunity and autonomy to make an informed and independent, but irrevocable, decision (“sell” or “continue”) at each Q. Figure 2 is an example of such a diagram.

Figure 2 – Example of diagram, showing the position of Beta stock at Q4.



Initial investment:	USD 1,000.00
Previous portfolio position:	USD 1,106.00
Present portfolio position:	USD 1,352.00

Decision: 1 – Sell 2 – Continue

Source: By the authors.

To prevent the investors from influencing each other, no information exchange or sharing of decisions was permitted. At the end of each sequence of decisions, the forms were collected and the results were registered.

The distribution of the investors into two groups of 53 individuals each was necessary to test our hypotheses. Thus, in Group 1 the firms which registered gains (Alpha and Beta) were presented prior to the firms which registered losses (Gamma and Theta). In Group 2, the order was the opposite. Differences with

regard to loss aversion were detected by comparing the average values obtained for the two groups. Investors who at the moment of decision took into account the anchor values initially established for gains and losses were considered to respect their own limits. On the other hand, the existence of significant differences between the established anchor values and average gains/losses was considered evidence that investors did not respect their own limits.

Based on the theoretical framework of the study, two hypotheses were formulated:

- Hypothesis 1: investors respect self-established anchor values for gains and losses on investments in stock.
- Hypothesis 2: investors become more tolerant of losses after experiencing a situation of gain.

Our findings were submitted to statistical analysis by comparison of mean values and frequencies using Student's *t* test and the chi-square test, respectively. The confidence limit was set at 95%. In addition, descriptive statistics was used to obtain a better overview of the investor profiles.

In the following, we present and discuss the results of the study, in accordance with the methodology adopted.

4 RESEARCH ANALYSIS

The study participants (=investors) were distributed in two groups of 53 subjects each. Initially, the investors in Group 1 were shown the results of the firms which registered gains in the period (Alpha and Beta) whereas the investors in Group 2 were shown the results of the firms which registered losses in the period (Gamma and Theta). This procedure made it possible to compare the investors' behavior in relation to gains and losses and detect signs of loss aversion. All other results were pooled for the two groups. Table 3 shows the profile of the investors in each group.

Table 3 – Profile of the two groups of subjects (investors) participating in the study.

Group	Male (n)	%	Female (n)	%	Mean age	σ	VC(a)
1	26	50.98%	27	49.09%	26.40	2.66	10.08%
2	25	49.02%	28	50.91%	27.36	2.03	7.42%

Note: n=number of subjects; σ =standard deviation; VC(a)=age variation coefficient.
Source: By the authors.

The two groups presented similar profiles and very little age dispersion (age variation coefficient <15%) (HAIR *et al*, 2010). The small dispersion in age and similarity in the gender ratio helped minimize the influence of these factors on decision making behaviors.

The investors were asked to establish anchor values for satisfactory gains and tolerable losses and to indicate their self-perceived investor profile as either aggressive (A), moderate (M) or conservative (C). The results are pooled in Table 4.

As shown by the chi-square and *t* test results obtained with 95% confidence limits (Table 4), the groups did not differ significantly with regard to investor profile or anchor values, indicating the groups may be compared directly when testing our hypotheses.

Table 4 – Self-perceived investor profile and anchor values for satisfactory gains and tolerable losses.

Group	Profile (n)					Mean gain/loss ratio							
	A	M	C	χ^2	sig	Gain	σ	t	sig	Loss	σ	T	sig
1	6	9	38	2.670	0.263	21.32%	19.74%	-	0.762	13.11%	18.75%	0.840	0.403
2	6	16	31			22.58%	23.07%	0.303		10.51%	12.63%		

Note: n=number of subjects; σ =standard deviation; χ^2 =chi-square test for equality of frequencies; t=Student's *t* test for equality of means; sig=probability value obtained with the test. Source: By the authors.

Note the high concentration of subjects perceiving themselves as conservative investors. Decisions to sell stock or continue with the investment beyond the established anchor values for gains and losses was considered a deviation from the self-perceived investor profile.

As explained above, the investors had the opportunity to make investment decisions at five different points in time. Each decision reflected a behavior which could be analyzed against the investor's self-perceived profile (Table 5).

Table 5 – Relation between decision to sell stock at each Q (quarter) and investor profile.

Firm	Var.Q1	Profile	Var.Q2	Profile	Var.Q3	Profile	Var.Q4	Profile	Var.Q5	Profile
Alpha	17.09%	C	-0.68%	C	-11.62%	M	32.48%	A	44.27%	A
Beta	-6.42%	C	3.80%	C	10.60%	M	35.20%	A	54.20%	A
Gamma	36.88%	C	-31.21%	A	-68.09%	A	-89.36%	A	-78.72%	A
Theta	-7.14%	C	-35.07%	A	-55.88%	A	-61.01%	A	-64.14%	A

Note: Var=gain or loss at the moment of decision; Q=quarter; A=aggressive; M=moderate; C=conservative. Source: By the authors.

Table 5 shows that, for example, selling Gamma stock at Q4 would be an aggressive decision since it would mean accepting a loss of over 89%, which is far above the average anchor value for losses established by the investors. Any decision at Q1 would be considered conservative since it is the first opportunity for investors to make a choice. From this point on, investor behavior was classified in relation to the average anchor values informed.

Student's *t* test for equality of means was used to detect the presence of loss aversion (KAHNEMAN and TVERSKY, 1979) in Group 1 (initially exposed to the firms which registered gains) and Group 2 (initially exposed to the firms which registered losses).

From the point of view of rationality and conservatism, investors are expected to become more cautious, conservative and risk-averse after experiencing a situation of loss. Therefore, the average gain in Group 2 ought to be significantly smaller than the average gain in Group 1. This, however, was not the case, as shown in Table 6. In fact, the investors in our study experienced similar levels of losses whether their initial experience was positive or negative. Thus, the two groups cannot be said to differ with regard to loss aversion.

Table 6 – Comparison of average gains and losses of investors in Groups 1 and 2.

Firm	Group	N	μ	σ	DF	t	sig
Alpha	1	53	28.68%	20.75%	104	-0.314	0.754
	2	53	29.91%	19.40%			
Beta	1	53	43.34%	17.23%	104	0.358	0.721
	2	53	42.06%	19.60%			
Gamma	1	53	-66.08%	26.99%	104	0.232	0.817
	2	53	-67.30%	27.38%			
Theta	1	53	-50.85%	17.56%	104	0.960	0.339
	2	53	-54.15%	17.86%			

Note: n=number of subjects; μ =mean; σ =standard deviation; df=degrees of freedom; t=Student's *t* test for equality of means; sig=probability value obtained with the test.

Source: By the authors.

This finding does not lend support to the expected utility hypothesis, according to which investors always strive to maximize gains while protecting their assets. In our study, investors initially exposed to losses beyond the established anchor values generally were not intimidated by the experience but adopted an even more aggressive investment behavior.

The evaluation tested whether investors are willing to go beyond the limits established before entering the market. In addition, we compared the decisions of each investor for each stock with the investor's self-perceived profile. Table 7 shows the distribution of decisions and the investor profile they correspond to in terms of gains or losses. The observed behavior revealed a much larger proportion of aggressive investors (A) than that indicated by the questionnaires.

Table 7 – Frequency of investor profiles according to investment decisions for each firm.

Firm	A	%	M	%	C	%	Total
Alpha	82	77.40%	13	12.30%	11	10.40%	106
Beta	89	84.00%	9	8.50%	8	7.50%	106
Gamma	102	96.20%	0	0.00%	4	3.80%	106
Theta	97	91.50%	0	0.00%	9	8.50%	106

Note: A=aggressive; M=moderate; C=conservative.

Source: By the authors.

In actual practice, investors take much greater risks than they are willing to admit, especially when losses are escalating. This is sometimes referred to as "myopic behavior" (HAIGH and LIST, 2005). In the perspective of classical economic theory, once losses reach an established percentage limit, investors would be expected to sell their stock to avoid further loss of assets and raise the utility of the investment. However, many of the investors in our study appeared to be smitten with unrealistic optimism (WEINSTEIN, 1980) or the gambler's fallacy (BAZERMAN and MOORE, 2008) and continued with their bad investments in the hope of a reversal at any moment (ARIELY, 2008).

In other words, our first hypothesis (that investors respect self-established anchor values for gains and losses on investments in stock) must be rejected. This is clearly illustrated in Table 8.

Evidently, when experiencing a situation of gain, investors tend to believe the positive trend will continue and may become overconfident in an attempt to

maximize their gains beyond the initial anchor values. This supports the claim that investors display loss aversion when they are in a situation of gain but are willing to take greater risks after facing a situation of loss (KAHNEMAN and TVERSKY, 1979). The opposite is also true: investors display greater tolerance to losses once their limits have been exceeded.

Table 8 – Comparison of self-established anchor values for gains and losses and actual investment results.

Firm	Result	Acceptable gain/loss	Obtained gain/loss	df	t	sig
Alpha	Gain	21.95%	29.29%	105	15.082	0.000
Beta	Gain	21.95%	42.70%	105	23.921	0.000
Gamma	Loss	-11.81%	-66.69%	105	-25.372	0.000
Theta	Loss	-11.80%	-52.50%	105	-30.536	0.000

Note: df=degrees of freedom; t=Student's *t* test for equality of means; sig=probability value obtained with the test.

Source: By the authors.

Our results show that in certain situations investors lose their point of reference and begin to make decisions based on diffuse elements rather than analyzing the context and tendency of the market with rationality. The acceptance of losses that would reduce their capital to near nothing is a clear indication that investors are not making rational decisions but are overconfident that the tide will turn and that present losses will be compensated by future gains (BAZERMAN and MOORE, 2008).

The results of this study lend support to the claims of Simon (1956), Tversky and Kahneman (1974), Kahneman and Tversky (1979), Weinstein (1980), Barberis et al (1998), Haigh and List (2005), Bazerman and Moore (2008) and Blavatsky (2009) that financial decision making is subject to the influence of behavioral elements, heuristics, biases and unrealistic optimism, all of which contribute to raise expectations of future gains.

5 FINAL REMARKS

The objective of the present study was to evaluate how investors behave when making decisions which involve gains and losses beyond the limits they consider acceptable. The experiment was set in the framework of behavioral accounting and finance, with emphasis on heuristics and biases associated with anchoring and representativeness.

Our results show that investors do not respect the limits they establish as anchor values for satisfactory gains and tolerable losses. This finding contradicts the notion that investors generally engage in the practice of anchoring. The anchor values established by the investors in our study were ignored at the moment of decision to sell stock or continue with the investment, generating results outside the acceptable limits.

Loss aversion was observed when the investors refused to sell their stock during a downturn caused by ill-defined adverse factors, and, in a spirit of overconfidence and unrealistic optimism, decided to continue with the investment in the hope that the situation would soon be reversed.

A behavior which leads to increased losses, seriously jeopardizing the integrity of the invested capital, contradicts the assumptions of the expected utility hypothesis. Furthermore, since our study revealed the opposite of what would be expected from perfectly rational investors intent on increasing, or at least protecting, their assets, it raises questions about the applicability of the principle of rationality to accounting and finance.

While our results lend support to the basic claims of behavioral accounting and finance, they are not generalizable or definitive, but require confirmation through further studies. In this respect, it might be useful to evaluate the behavior of investors in real-life situations or in contexts which allow measuring the impact of the use of real financial resources on decision making during moments of expressive gains and losses. Evaluations involving investments made in real time may yield results different from the results of the present study and would be useful in comparative studies.

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