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PROFESSIONAL MASTER'S DEGREE**

**SIMULAÇÃO DE CENÁRIOS PARA REGULAÇÃO EMOCIONAL
DE INVESTIDORES EM AÇÕES**

**SCENARIO SIMULATION FOR EMOTIONAL REGULATION
OF STOCK INVESTORS**

[TRADUÇÃO INGLESA]

ALCINÉIA DE BORTOLI

CASCADEL/PR

2022

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Dissertation presented in partial fulfilment of the requirements for the degree of **Master of Science in Administration** in the Department of Administration, Western Paraná State University. Dissertation. Supervisor: Prof. Dr. Claudio Antonio Rojo

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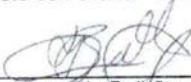
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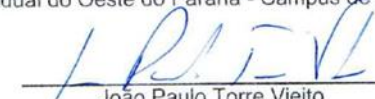
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RESUMO

Bortoli, Alcinéia de (2022). Simulação de Cenários para Regulação Emocional de Investidores em Ações (Dissertação). Programa de Pós-Graduação em Administração (PPGAdm), Universidade Estadual do Oeste do Paraná – UNIOESTE, Cascavel, PR, Brasil.

Em sua maioria, esses investidores adentram o mercado de ações com pouco conhecimento sobre o assunto e aprendem à medida que operam na compra e venda de ações. O processo de aprendizagem pode apresentar tanto perdas quanto ganhos em função do perfil do investidor e da exposição ao risco. Muitos investidores tomam decisões equivocadas, sejam os iniciantes ou investidores experientes; isso porque a racionalidade humana para tomada de decisão é limitada (Simon, 1981). Além disso, tanto as emoções quanto os vieses cognitivos interferem nesse processo de tomada de decisão. Esta pesquisa teve como propósito a construção de um roteiro baseado no Modelo Rojo de Simulação de Cenários para a regulação emocional de investidores em ações. Utilizou-se o método exploratório-descritivo, sendo a abordagem qualitativa e a técnica de coleta de dados feita por meio de Bola de Neve. O método de amostragem adotado foi o não probabilístico por conveniência. O mapeamento das emoções, a utilização de técnicas de regulação emocional (Gross 2008), o mapeamento das heurísticas e vieses (Kahneman 2012), bem como a simulação de cenários (Rojo 2006) podem contribuir para decisões mais assertivas na compra e venda de ações, mesmo para os investidores mais experientes. Os resultados desta pesquisa reforçam a importância de atentar para a presença e uso de heurísticas e vieses na hora de tomar decisões e as consequências potenciais, nem sempre agradáveis, decorrentes delas.

Palavras-chave: cenários, investimentos, decisões de investimentos, finanças comportamentais, regulação emocional.

ABSTRACT

Bortoli, Alcinéia de. (2022). Scenario Simulation for Emotional Regulation of Stock Investors (Dissertation). Post-Graduate Program in Management (PPGA), State University of Western Paraná – UNIOESTE, Cascavel, PR, Brazil.

Most investors enter the stock market with little knowledge of the subject and learn as they trade stocks. The learning process can present losses and gains depending on the investor's profile and risk exposure. Many investors make wrong decisions, whether beginners or experienced investors because human rationality for decision-making is limited (Simon, 1981). Moreover, both emotions and cognitive biases interfere in this decision-making process. This research aimed to construct a script based on Rojo's Scenario Simulation Model for the emotional regulation of stock investors. The exploratory-descriptive method was used, the approach was qualitative, and the data collection technique was done through the snowball technique. The sampling method adopted was non-probability by convenience. The mapping of emotions, the use of emotion regulation techniques (Gross 2008), the mapping of heuristics and biases (Kahneman 2012), as well as scenario simulation (Rojo 2006) can contribute to bold decisions when buying and selling stocks, even for the most experienced investors. The results of this research reinforce the importance of paying attention to the presence and use of heuristics and biases when making decisions and the potential consequences, not always pleasant, arising from them.

Keywords: scenarios, investments, investment decisions, behavioral finance, emotion regulation.

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1 INTRODUCTION

Over the last four years, the growing number of individual investors who have joined the *Brasil, Bolsa, Balcão - B3* stock market reflects investors' interest in buying and selling shares. The most significant increase in the number of investors occurred between May 2019 and October 2020, when the number escalated from 1 million to almost 3.2 million. In general, these new investors enter the stock market with some information about the subject, and as they operate in the buying and selling of shares, they begin to acquire more excellent knowledge about the market (B3, 2019, 2020, and 2022).

A scenario of instability and volatility characterizes the stock market; under these circumstances, investors make their decisions to buy and sell stocks. In this scenario, emotions, experiences, attitudes, and habits directly influence decision-making. The situations of risk and uncertainty, as in the case of stock investments, mean that the decision process can be directly affected by individual emotions and experiences (Katona, 1975). When faced with emotions, such as fear, anxiety, and sometimes anger, investors become subject to deregulation and difficulty regulating emotions since human beings are not entirely rational regarding decision-making.

Based on the fundamentals of bounded rationality, that is, the inability of human beings to make decisions based on rationality alone, presented by Simon (1955) and later reinforced by the studies developed by Kahneman and Tversky (1974) on heuristics and cognitive biases observed in the decision-making process, the field of behavioral finance emerged, in which there is a decision to study how behavior and emotions influence money-related decisions.

The mapping of these emotions, heuristics, and biases, as well as the simulation of scenarios, may assist investors in making more assertive decisions regarding purchasing shares. Thus, this study proposes a script for emotional regulation based on Rojo's (2006) Scenario Simulation Model to benefit these investors in their decision-making. This work does not intend to exhaust the studies on the subject, an area still little explored in the country, but to contribute to the research in order to evolve in all academic aspects.

1.1 RESEARCH PROBLEM

There is no emotional regulation model for investors.

1.1.1 Research Question

Based on Rojo's model of scenario simulation, what should a script for the emotional regulation of stock investors contain?

1.2 OBJECTIVES

1.2.1 General

To build a script based on Rojo's Scenario Simulation Model for the emotion regulation of stock investors.

1.2.2 Specific

- a) To survey what are the primary emotions present in investors' decisions;
- b) To identify the main heuristics and cognitive biases that affect stock investors' decisions;
- c) To introduce emotional regulation tools for decision-making.

1.3 JUSTIFICATION

There is no emotional regulation script for investors to decide about their investments.

1.4 REPORT STRUCTURE

The first chapter comprises the contextualization and delimitation elements of this research: the abstract, the research problem, the general and specific objectives, the delimitation, the justification, and, finally, the structure of the work.

The second chapter presents the theoretical background, divided into the following sections: 2.1 - The profile of B3 investors; 2.2 - The influence of emotions on the decision process; 2.3 - Cognitive biases in investment decisions, and section 2.4 – Rojo's Model for Scenario Simulation and its contributions to stock investors.

The third chapter includes a description of the methodology adopted and the data collection and analysis process. The fourth chapter comprises the discussion and analysis of the results, and the fifth and final chapter presents the final considerations about the research and recommendations for future research.

THEORETICAL BACKGROUND

The emergence of "currency and economic activity supported the development of systems of the most varied that, added together, originated the financial activity" (Rojo, 2019, p.9). Consequently, financial institutions emerged to establish and regulate the financial activity, store money, and serve as an issuer of securities that guaranteed financial agreements between individuals. Thus, economic development promoted the emergence of a financial system capable of safeguarding financial relations between individuals, peoples, and nations (de Brito, 2020).

In Brazil, the financial market has evolved gradually, driven as much by technological and financial development as by the intellectual development of the population (de Brito, 2020). The historical evolution of the national financial system can be divided into four phases: from the arrival of the Portuguese royal family in Brazil, in 1808, to World War I, in 1914; from World War I to World War II until 1945; and then until 1964, with the Financial Reform until the present day (Puga, 2009; de Brito, 2020).

The current national financial system is composed of monetary authorities (regulatory and supervisory) and financial institutions (public and private); these agents are oriented to control systemic risk, obtain results and manage the economy (Puga, 2009; de Brito, 2020). Based on this composition, the financial market provides investors with regulation and security for the application of their investments.

Brazilian investors can buy and sell stocks through the *Bolsa, Brasil, Balcão* (B3). B3 is the largest depository of fixed-income securities in Latin America and the country's largest private asset clearing house. It originated from the merger of the following companies: *Bolsa de Mercadorias & Futuros* (BM&F) BOVESPA and the *Central de Custódia e Liquidação Financeira de Títulos* (CETIP) (B3, 2020).

1.5 PROFILE OF INDIVIDUAL INVESTORS AT B3

The investor profile is a classification of investor types based on investment objectives, return expectations, and the level of risk each investor is willing to take (Puga, 2009; Investor Portal, 2022).

The main criteria for defining the investor profile are the objectives, the financial situation, and the knowledge to understand whether the risks are compatible with the product,

service, or operation chosen; moreover, they determine the investor's classification, preferences, knowledge of the risks, the period investments are to be kept, and the purposes of these investments (Portal do Investidor, 2021).

In order to meet the requirements established by the Securities and Exchange Commission of Brazil (CVM), to align the investor's profile to the risk he intends to be exposed to, financial institutions such as stock exchanges, banks, and brokerage houses prepare questionnaires called Investor Profile Analysis (IPA). These institutions ask the investor to fill it out in order to evaluate and classify him into predetermined risk profile categories. In general, the following definitions are used to classify the investor's profile: the conservative profile, which is characterized by the search for security in the first place and avoids exposure to volatility and instability of the stock market; the moderate profile, which seeks a balance between risk and the best return; and the bold profile, which is more willing to accept the volatility of variable income. Brazilian Financial and Capital Markets Association – ANBIMA (2021).

The investor's profile varies according to the level of knowledge he has about investments. In general, the Brazilian investor imagines that investing is like climbing the steps of a ladder that naturally starts in savings and becomes more complex and risky, going through Private Pension, Treasury Direct, Fixed Income, Investment Funds, and Stocks (B3, 2019).

In 2019, B3 conducted a survey called *Ecossistema do Investidor Brasileiro* (Brazilian Investor Ecosystem), which revealed that investors are afraid to invest their money into products they have little or no knowledge of. Therefore, the investor's journey, for the most part, begins with savings; as they acquire greater information and knowledge on the subject, they advance by climbing the ladder (B3, 2019).

The investment theme has become increasingly recurrent in the daily lives of Brazilians, substantially increasing the number of investors who wish to invest their money and obtain higher gains to raise their standard of living. The dissemination and disclosure of information about investments through access to the internet and other media, such as online courses and finance influencers on social networks, have stimulated the search for learning and the increased entry of investors into the stock market (B3, 2019).

According to the individual investor profile report released by B3, in December 2020, the number of people investing in the stock market jumped from 1 million in May 2019 to almost 3.2 million in October 2020 (B3, 2020). This number continued to grow, and amid the

pandemic and the high volatility of the stock market, there was a significant increase of almost 300%. In the first half of 2021, this growth was 17%, reaching the mark of 3.8 million individual investor accounts, with 500,000 new accounts in the first half of 2021; in November 2021, the new B3 report pointed to an increase of more than 800,000 new investors and, by the end of 2021, this number increased and exceeded the historical mark of more than 4 million individual investors in variable income (B3, 2021).

The growth in the number of investors and the increase in the trading volume set the diversification of investment products in motion. The product portfolio, which in 2016 was concentrated 75% in equities only, started to present a different scenario in December 2021, with 35% in equities and a portfolio including at least two other products, among them real estate funds (B3, 2021).

The increase in the number of investors who have started to trade on the stock exchange in the last few years is directly linked to the growing increase in information about investments conveyed in the media. Investors differ in their objectives and exposure to risk; this diversity of objectives is relevant and needs to be considered in the investment decision-making process. Moreover, the stock-buying process by new investors is affected by both the lack of knowledge on the subject and the complexity of the financial ecosystem. Also, it is influenced by the investor's journey, which goes through several stages, from learning about the products to gaining the emotional security required to invest.

Although these investors seek to deepen and learn more about the methods, techniques, and forms of analysis for buying stocks, not all have the perception of how their personal experiences and emotions impact the decision-making process of buying and selling stocks since few people make financial decisions based on a spreadsheet and usually do so connected to their personal experiences (Morgan, 2021). Thus, it is necessary to remember that each investor has characteristics that, influenced by life history, interests, level of risk acceptance, and emotions, impact the decision process of buying and selling stocks. Besides, people may use different reasoning strategies to make financial decisions depending on their trading experiences (Vieito, da Rocha, & Rocha, 2015, p.229).

1.6 THE INFLUENCE OF EMOTIONS IN THE DECISION PROCESS

The brain systems and mechanisms involved in perceiving a stimulus and the manifestation of a response are high-speed and, when activated, generate a series of bodily

reactions that prepare the individual to act when faced with environmental challenges and dangers. Given this, it was due to this function of immediate responsiveness that the human species has managed to survive and perpetuate itself throughout history (Bear, Connors, & Paradiso, 2002; Fonseca, 2016; Plutchik, 1980).

The reactions of individuals to the environment are directly associated with the manifestation of emotions, so they are characterized by brief, involuntary, systemic, and standardized responses of actions to internal and external stimuli (Linehan, 2018). Emotions have ancient biological roots, and their evolutionary maintenance is affected by their value for the survival of species and individuals (Consenza, 2011). Emotions have been a fundamental part of human learning as they contribute to adaptation to the environment, the development of cognition, the content, and the thought process (Fonseca, 2016, p.35). Thus, it can be stated that "cognitive abilities evolved along with the evolution of the brain, and cognitions evolved largely in the service of emotions" (Plutchik, 1980, p.12).

Emotions can be defined as "multifaceted, embodied phenomena that involve weakly coupled changes in the domains of subjective experience, behavior, and peripheral physiology, response tendencies that can be modulated in a variety of ways" (Gross, 2008, p.499). In other words, emotions are organized responses, crossing the boundaries of many subsystems of psychology, including the physiological, the cognitive, the motivational, and the experiential. Emotions typically arise in response to an internal or external event that has a valid positive or negative meaning for the individual (Mayer and Salovey, 1990, p.186).

Due to the multidimensional nature of emotions, which comprise a set of processes, none of which is sufficient to term an experience as an emotion (Leahy, 2013), it is not possible to identify precisely which neural structures and neurobiological mechanisms are involved in each emotion. However, neuroscience has shown that cognitive and emotional processes are deeply intertwined (Consenza, 2011), i.e., "emotions are psychological events like memories, so they are best thought of as products of distinct but interactive psychological processes with accompanying neural systems" (Barrett & Wager, 2006, p. 83).

Emotions can be classified by "valence (positive and negative) and also by three groups: primary or basic, secondary, and background emotions" (Lent, 2010, p. 716). Primary or basic emotions are joy, sadness, fear, disgust, anger, and surprise, which originate in the network of neural circuits of the limbic system, the amygdala and the cingulum, which are their triggers (Pereira, Ribeiro, Depes, & Santos, 2013). Secondary emotions are learned and depend on sociocultural factors, varying in time and space - guilt, shame; through them, the

individual obeys or not the rules of behavior that society recommends; background emotions, such as well-being or uneasiness, calm or tension - are internal, visceral stimuli and are expressed in musculoskeletal changes (posture, body movement) (Damasio, 2012; Lent, 2010).

The construct of emotion is related to three main characteristics: (a) the triggering of a particular emotion is linked to the meaning that is attributed to the event that triggers it; (b) emotions are multifaceted, involving physiological, behavioral, and subjective aspects; (c) emotions are flexible, and can be modulated through various strategies (Gross, 2008).

An emotion, be it primary, secondary, or background, manifests itself in a context in which a situation mobilizes the attention of an individual (context-individual-situation), who will cognitively evaluate it and generate a response (explicit or implicit), under a given circumstance. Therefore, according to the modal model, represented in Figure 1, proposed by Gross, each of the processes involved in eliciting an emotion (Situation, Attention, Evaluation, and Response) enables an opportunity to regulate it (Gross, 2008).

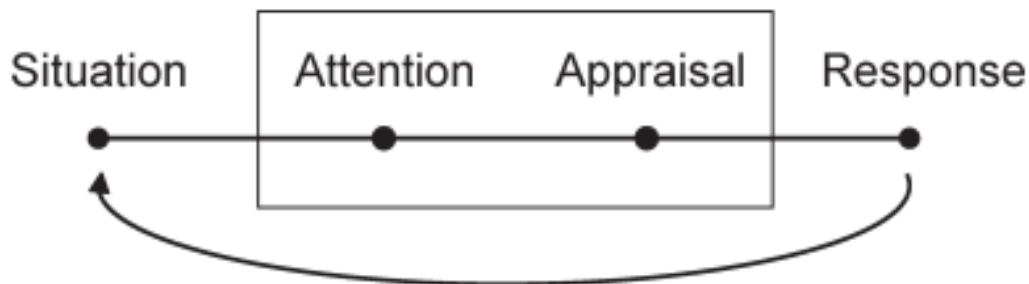


Figure 1: The modal model of emotion.
Source: Gross (2008)

The model proposes that the situation that generates the emotion can be altered due to the response given to the situation. The recurrent aspect of emotion, represented in Figure 1 by the lower arrow, demonstrates that there is feedback in the process; that is, the emotions themselves constitute a new situation, which will be noticed and evaluated and will give rise to a new line of behavioral responses (Gross, 2008).

Whatever goal and whatever meaning a situation have for the individual, it is that meaning that will give rise to the emotion. As the goal or meaning can change over time (due to a change in the person, the situation, or the meaning of the situation to an individual), so does the emotion (Gross, 2008, p.498).

The process and "the ability to perceive emotions, to access and generate emotions, to help thinking to understand emotions and emotional knowledge, and to control emotions reflectively to promote emotional and intellectual growth" (Mayer & Salovey, 1997, p.17) are defined as emotional intelligence. It can also be understood as:

a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life. (Salovey & Mayer, 1990, p.185).

Among the skills required for processing emotional information are: 1. Perceiving Emotions, which refers to the ability to identify and express emotions in their physical states, feelings, and thoughts, as well as to identify the expression of emotions in other people, artwork, language, and others.; 2. Facilitating Thought, which refers to the use of emotions to prioritize thinking in productive ways and generate emotions to aid judgment and memory; 3. Understanding emotions through defining emotions, including complex emotions, recognizing simultaneous feelings, and understanding emotional change; 4. Managing Emotions, which is about remaining open to feelings and monitoring and regulating emotions to promote emotional and intellectual growth (Mayer, Salovey, Caruso, & Cherkasskiy, 2011, p.532).

As part of emotional intelligence skills, emotion regulation "refers to the processes by which we influence our emotions, when we have them, and how we experience and express those emotions" (Gross, 2008, p. 500). The individual's goal with emotion regulation is essentially to decrease the experiential or behavioral aspects of negative emotions, including anger, fear, and sadness (Gross, 2008). Moreover, emotion regulation can occur through intrinsic processes - when the individual seeks to self-regulate his emotions - or extrinsic processes - when the individual seeks to rely on someone else's regulation, on the environment, or, furthermore, on both processes.

Emotion regulation can be defined as the ability to (1) inhibit inappropriate and impulsive behavior related to strong negative or positive emotions; (2) organize internally for coordinated action toward an external goal (i.e., act in a non-mood dependent manner when necessary); (3) reduce the intensity of any physiological activation/excitation that the intense emotion has induced; and (4) alternate attentional focus in the presence of intense emotion (Linehan, 2018, p.6).

Emotional regulation refers to tolerating pleasant or unpleasant emotional reactions, understanding them without exaggerating or diminishing their importance, and controlling or discharging them appropriately (Mayer & Salovey, 1997).

Based on the modal model of emotions, presented in Figure 1, Gross (2008) proposes five emotion regulation strategies; Figure 2 demonstrates situation selection, situation modification, attention deployment, cognitive change, and response modulation.

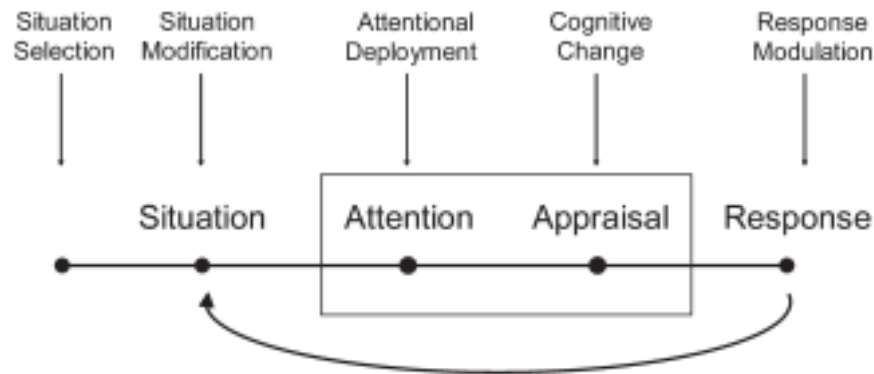


Figure 2 - Emotion regulation process
Source: Gross (2008)

Situation selection distances from the individual's active decision-making and effort to seek out the situation that elicits the emotion they would like to experience. Consequently, it is possible to avoid situations that may give rise to the emotion they prefer to avoid. Hence, situation selection refers to the subset of those choices that are made, with at least partial regard for the future consequences of actions for emotional responses (Gross, 2008).

Situation modification deals with "efforts to modify the situation directly to alter its emotional impact" (Gross, 2008, p.502). In other words, the active behavior of the individual to find alternatives to solve problems in the physical environment or the use of intentional expression of emotion to change the course of the ongoing interaction during a specific situation.

The deployment of attention refers to "influencing the emotional response by redirecting attention within a given situation" (Gross, 2008, p.502), i.e., it is characterized as a strategy to change the focus. Among the main forms of the unfolding of attention is a distraction, in which the individual intentionally seeks to place his attention on a different situation or person that causes discomfort, or rumination, in which the individual directs the focus to a sequence of thoughts outside the current situation.

The cognitive change aims to alter the meaning of the emotion by changing the way the individual thinks about the situation itself and their ability to manage the demands that the situation imposes. In other words, the individual reevaluates and changes "the meaning of a

situation such that there is a change in the person's emotional response to that situation" (Gross, 2008, p.503).

Response modulation is "influencing physiological, experiential, or behavioral responses in a relatively direct way. For example, exercise and relaxation can be used to decrease physiological and experiential aspects of negative emotions" (Gross, 2008, p.504). One form of the modulation of responses is expressive suppression, which refers to attempts to decrease expressive behavior of emotion, i.e., the display of emotion.

The modal model's emotion regulation strategies are based on the premise that emotions "are characterized by malleability, and this aspect is crucial for emotion regulation" (Gross, 2008, p.499). These strategies are extremely important for human beings as, when faced with different situations, they facilitate adaptation by preparing behavioral responses, since, "without emotional self-regulation functions, history would be chaotic, and learning an indescribable drama, emotions would take over cognitive functions and human beings would only know how to act in an impulsive, excitable, euphoric, episodic, and de-planified way" (Fonseca, 2016, p.35).

As such, emotion dysregulation is characterized by "difficulty or inability to cope with experiences or process emotions" (Leahy, Tirch, Napolitano, 2013), that is, "to alter or regulate emotional signals, experiences, actions, verbal responses, and nonverbal expressions under conditions adverse to those known to the individual" (Linehan, 2018).

The main characteristics of emotional dysregulation are as follows:

Excess of painful emotional experiences; an inability to regulate intense arousal; problems turning attention away from emotional cues; cognitive distortions and failures in information processing; insufficient control of impulsive behaviors related to strong positive and negative affect; difficulties organizing and coordinating activities to achieve non-mood-dependent goals during emotional arousal; and a tendency to "freeze" or dissociate under very high stress (Linehan, 2018, p.6).

Therefore, when emotions are manifested at the wrong moment or even at an inadequate frequency and intensity, they are perceived as deregulated (Gross, 2008), which is why the emotional regulation strategies proposed by Gross (2008) aim to recognize and improve emotional responses through the focus on antecedents with the selection of the situation, modification of the situation, unfolding of attention, in addition to the focus on the response through cognitive change and response modulation. "This is why the human brain integrates numerous complex neural processes for producing and regulating emotional responses" (Fonseca, 2016, p.35).

In order to guide the interactions of the individual with the environment and other individuals, in addition to the human learning process, from the neuroscience point of view, the most demanded skills at the brain level are listed as cognitive, relational, and emotional (Pereira *et al.*, 2013). Therefore, the cognitive process has evolved over millions of years so that evaluations of events and stimuli would be more correct and predictions more accurate in order for emotional behavior to be adaptively related to stimulus events (Plutchik, 1980).

Thus, it is possible to state that emotion directs, leads, and guides cognition; one cannot understand learning without recognizing its role in such an essential human adaptive function (Fonseca, 2016). Emotions interfere with various aspects of mental functioning and influence the focus of attention, what is learned, what is remembered, and the judgments and decisions made. "The sophisticated allocation of attention has been honed over a long evolutionary history. Rapid orientation and reaction to the most serious threats or the most promising opportunities improved the chance of survival" (Kahneman, 2012, p.47).

Therefore, the decision-making process is linked to the location of attention defined throughout the life history, preferences, and daily life of individuals, being necessary to make daily choices among the available alternatives, whether complex or not (Hastie, 2001). In the decision-making process, it could be argued that emotions are present and influence the action and behavior of the individual, and, therefore, the search for the integration between emotion and cognition has been advancing with studies on emotional intelligence and the skills that compose it, such as emotional regulation (Plutchik, 1980).

To deal with the various situations experienced daily by human beings, it is necessary to understand that emotional regulation is essential to maintain the individual's balance to promote decisions. In this sense, the first step is to recognize the emotions; the second is to establish steps for emotional regulation, to then make decisions.

1.7 COGNITIVE BIASES IN INVESTMENT DECISION

Throughout the evolutionary process, humans have always had to make choices. On their way, they have encountered a crossroads, a fork, a dead end, and sometimes they have had to go backwards. They needed to develop the ability to choose among the various possibilities presented, even without knowing if it was the best choice; often without the time, knowledge, and discernment to weigh all the possible choices. Therefore, making decisions is

inherent and intrinsic to the life of human beings, whether in processes of choice or problem solving (Hammond, Keeney, & Raiffa, 2017).

Although human beings make several decisions during a day, the decision-making process is intriguing and does not always translate into good outcomes, as the individual tends to be guided by different decision-making processes, among them, a judicious assessment of the situation or simply deciding by intuition. Understanding the influence of emotions on the decision-making process, the pathways, and operations that precede choice, perception, and evaluation is essential to understanding how humans make decisions (Ariely, 2019). The field of behavioral finance has been dedicated to studying how humans interpret information and how they make investment decisions (Thaler, 1998) and is considered to be the field of research that "applies psychology to financial behavior" (Baker & Nofsinger, 2002, p.98).

When faced with the need to make a choice, the brain looks for cues from stored information from previous experiences and uses that memory and intuition for decision-making, i.e., "moments when personal history, unique worldviews, ego, pride, marketing, and unlikely stimuli merge to form a narrative that makes sense to each individual" (Morgan, 2021, p.28).

Human beings have limited rationality to process available information, making it impossible to assimilate and understand the information needed to optimize the decision-making process (Robbins, 1998). "When people do not know how to optimize, they may well satisfy, find a good solution" (Simon, 1996, p.370); that is, stop the search for alternatives or answers when they find an alternative that satisfies the need or solves the problem at hand. "The idea that we have limited access to the operations of our minds is hard to accept because it is, of course, foreign to our experience, but it is true: you know much less about yourself than you feel you know" (Kahneman, 2012, p.68).

Thus, given the impossibility of "analyzing all the vectors that may lead an individual to make a decision" (Bulhões & Ghiggi, 2021, p.2), the individual absorbs, understands, and decides based on his experiences, knowledge, and worldview, using, for this, most of the time, heuristics, that is, their system of rules, known as a mental shortcut (Stoner & Freeman, 1992; Silva, Lagioia, Maciel & Rodrigues, 2009; Dorow, Macedo, Nunes, Reina & Maximiniano, 2010; Sbicca, 2014).

Heuristics is a "simple procedure that helps find appropriate, though usually imperfect, answers to difficult questions" (Kahneman, 2012, p. 127). They can also be considered a "mechanism for coping with the complex environment surrounding our decisions. In general,

they are useful, but their use can sometimes lead to serious errors" (Bazerman, 2004, p.20). Cognitive biases, on the other hand, can be understood as "systematic errors that repeat predictably under particular circumstances" (Kahneman, 2012, p.10).

The systems of thought operation and decision-making can be represented and divided: System 1, which operates automatically and quickly, with little or no effort and no perception of voluntary control; System 2, which operates with an allocation of attention to laborious mental activities, such as complex calculations, and are therefore associated with the subjective experience of activity, choice, and concentration. The two systems work in association based on a highly efficient division of labor in that they minimize effort and optimize performance (Kahneman, 2012).

While "System 1 is gullible and prone to believe, System 2 is charged with doubting and disbelieving, but System 2 is sometimes found to be busy, and often lazy" (Kahneman, 2012, p.106). There is no possibility of turning off System 1, nor is there any possibility of increasing the monitoring and diligent activity of System 2, because constantly questioning one's thinking would be tedious; System 2 is too slow and inefficient to replace System 1. Hence, the best thing to do is to "learn to recognize situations in which mistakes are likely and try harder to avoid significant mistakes when there is too much at stake" (Kahneman, 2012, p.39).

As mentioned earlier, due to bounded rationality and the inability to process the volume of information available, people rely on various heuristics and biases for decision-making (Bazerman, 2004). The main heuristics used for decision-making are anchoring and adjustment, availability, and representativeness.

In the anchoring-and-adjustment heuristic, individuals make decisions based on a starting value, i.e., an anchor, which can be suggested from historical background or by random information, depending on how the problem is structured. "The psychological mechanisms that produce anchoring make us much more suggestible than most of us would like to be" (Kahneman, 2012, p.161). The tendency to anchoring can cause investors to set a particular anchor to buy or sell a stock, based on a price reached at a particular time, a previous sale or purchase, or some analyst's prediction, so investors tend to place little value on new information, even if it changes the analysis made about a particular stock (Fuller, 1998).

In the availability heuristic, the individual evaluates the frequency or probability of an event occurring from the possibility and ease of accessing similar cases available in memory;

moreover, events that are associated with emotions are remembered more quickly than those that do not have an effective character (Kahneman, 2012). Therefore, people often form opinions and make choices that directly express their feelings; that is, they make decisions consulting their emotions, with a tendency to approach or avoid, often without realizing what they are doing (Kahneman, Slovic & Tversky, 1974).

In the representativeness heuristic, the individual searches for characteristics that may correspond to previously formed stereotypes, i.e., they judge an event based on the most obvious characteristics of the fact being judged. "When people make judgments, there is a tendency to associate individuals, objects, or events, with previously formed stereotypes" (Bazerman, 2004, p.10). This heuristic can lead to some systematic errors, as some important characteristics may not be included in the judgment or the characteristics presented correspond to another stereotype. The "representativeness heuristic may cause investors to overreact to new information in forming their expectations about the future" (Fuller, 1998).

Several studies present evidence of the existence of a vast number of heuristics and cognitive biases in the investment decision-making process (Kahneman & Riepe, 1998; Kahneman, 2012; Nofsinger, 2006; Morgan, 2021; Bazerman, 2004). Tversky and Kahneman (1974) initially identified three heuristics responsible for a number of cognitive shortcuts used in the decision-making process, which will be used as categories of analysis in this research: anchoring, representativeness, and availability. These heuristics can correspond to a number of biases, and some biases can correspond to more than one heuristic, as illustrated in Table 1, below:

AVAILABILITY HEURISTICS BIASES	
EASE OF RECALL	Individuals judge that events more vivid in memory are more numerous than those of equal/greater frequency whose instances are not remembered.
RETRIEVABILITY	Individuals are biased in their frequency evaluations due to their memory processes.
PRESUMED ASSOCIATIONS	It considers the occurrence of associated events even when they are distant from each other.
REPRESENTATIVENESS HEURISTIC BIASES	
INSENSITIVITY TO BASE RATE	One ignores the proportions of the base in assessing the probability of events and focuses on descriptive information, even if irrelevant.
INSENSITIVITY TO SAMPLE SIZE	Individuals are often unable to appreciate sample size's role in assessing the information's reliability.

MISCONCEPTION OF CHANCE	Individuals ignore randomness in random events due to past events not having exact randomization of their outcomes.
REGRESSION TO THE MEAN	One ignores that extreme events tend to regress to the mean on subsequent trials.
CONJUNCTION FALLACY	Individuals misjudge that conjunctions (two events occurring together) are more likely than a more global set of occurrences, of which the conjunction is a subset.
ANCHORING-AND-ADJUSTMENT HEURISTICS BIASES	
INSUFFICIENT ADJUSTMENT ANCHORING	Individuals estimate values based on an initial value and generally make insufficient adjustments from that anchor to establish a final value.
CONJUNCTIVE AND DISJUNCTIVE EVENT BIAS	Individuals exhibit a bias for overestimating the probability of conjunctive events and for underestimating the probability of disjunctive events.
OVERCONFIDENCE	Tendency to the overconfidence of their judgments.
BIASES EMANATING FROM VARIOUS HEURISTICS	
CONFIRMATION BIAS	They seek confirmatory information for what they consider being true and neglect to look for non-confirmatory evidence.
HINDSIGHT BIAS	After ascertaining the occurrence or non-occurrence of an event, individuals tend to overestimate the degree to which they would have predicted the correct outcome.

Table 1 – Heuristics and Biases
Source: Adapted from Bazerman (2004).

Given the variability and instability of the stock market, many investors have difficulties in the decision-making process, either due to the lack of emotional regulation or the influence that emotions have in relation to heuristics and cognitive biases on the purchase decision. "Investors who are prone to these heuristics and cognitive biases will take on more risk than they can recognize, experience outcomes they cannot anticipate, be prone to unwarranted trading, and may end up blaming themselves or others for bad outcomes" (Kahneman & Riepe, 1998, p.53).

Therefore, it is possible to state that biases influence intuitive judgments and choices, and, "even those who understand modern investment tools can fail as investors if they let psychological biases control their decisions" (Nofsinger, 2006, p.6). "Maintaining vigilance against biases is hard work - but the chance to avoid a costly misunderstanding is sometimes worth the effort" (Kahneman, 2012, p.167).

1.8 SCENARIO SIMULATION FOR INVESTORS

Given the limited rationality of human beings, their decisions are influenced by several variables related to subjective preferences and the environment in which they are inserted (Simon, 1955). Thus, in complex, uncertain, and variable contexts, such as the stock market, the establishment of a model and scenario simulation can support investors in the decision-making process, enabling the reduction of risk and financial losses.

The model is a more straightforward representation of reality that aims to propose an analysis of alternatives with a defined purpose. Models are widely used because, after a certain level of complexity, it becomes impossible to correctly estimate the implications of a decision without effectively evaluating the available information in a logical or ordered manner (Andrade, 1989).

The model can be defined as "an external, explicit representation of part of the reality seen by the person who wishes to use that model to understand, change, manage, and control part of that reality" (Pidd, 1998, p.25). However, it should be considered that people have various worldviews, which can lead to different definitions of reality, generating multiple models for the same apparent reality (Rossoni, 2006).

Once the model or modeling is defined, it becomes possible to carry out the simulation, which consists of "obtaining a solution to a problem, from a model, through experimentation" (Acoff & Sasieni, 1971, p.12). The goal of the simulation is to propose the manipulation of a model in a way that provides a dynamic view of reality, that is, "models represent reality, simulation imitates it" (Acoff & Sasieni, 1971, p.114).

In summary, modeling is creating models, which are a simplified and explicit representation of reality for some defined purpose. In addition, simulation is the process of applying the model dynamically as a flow of input, processing, and output of something (Rossoni, 2006).

Scenarios are a way of trying to bring the future to an analysis in the present; they allow individuals "to prepare for and understand uncertainties and what they might mean. Scenarios help us hone our responses to possible futures and focus our responses as new possibilities appear on the horizon" (Chiavenato and Sapiro, 2003, p.176).

As such, techniques and tools for simulating scenarios can support individuals in their decision-making since the "scenario approach creates images and anticipates future situations, reducing the anxiety caused by the element of surprise" (Sousa and Rojo, 2010, p.119). Furthermore, as for the definition of variables, with well-defined problem situations and with

restrictions involved, it is possible to establish a model and then perform simulations, i.e., "the determination of critical variables serves as a basis for the application of adequate tools to supply strategists with information that assists in the formulation of strategies" (Rojo, 2006, p.39).

Given the complexity, variables, and uncertainties of the financial market, the establishment of a model and the simulation of scenarios is an important step that precedes decision-making since "the scenario simulation seeks to predict future events and show the possibilities of success and risks and makes it possible to decide based on the variables presented" (Sousa and Rojo, 2010, p.119). Thus, the proposition of a model for scenario simulation can assist individual investors in expanding the possibilities of rational analysis in much of their decisions since "the act of conducting planning is a way of seeking the greater potential for exploration of the rational side of a situational analysis" (Rojo, 2005, p.64).

Rojo's Scenario Simulation Model (2006) is composed of a script for the systematization of simulation studies, divided into five levels: level 1 is composed of the definition of variables; level 2 evaluates the competitive intelligence by means of the appropriate tools for this evaluation; level 3 performs the scenario simulation, which opens up forecasts for the formulation of strategies, which will be predicted on level 4, and then, on level 5, the application occurs, which consists of the dynamics of implementation, by means of action plans.

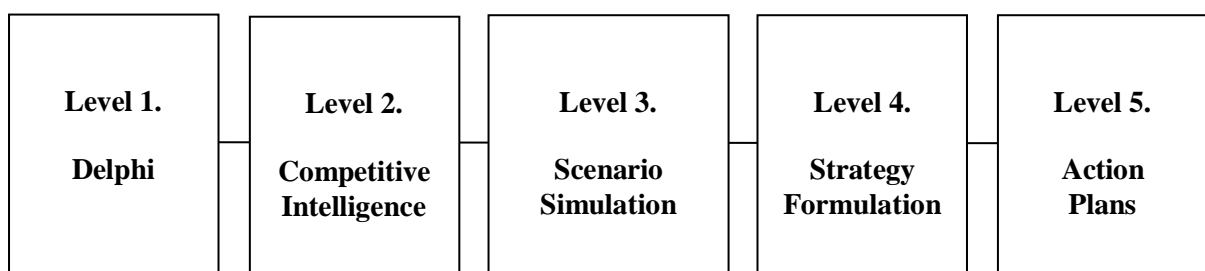


Figure 3: Rojo's Scenario Simulation Model
Source: Rojo (2006)

At level 1, the Delphi investigative technique is used to identify the critical variables. The survey of these variables is fundamental for the scenario simulation because the more precise the survey is, the more assertive the scenario simulation will be. "Due to the large volume of variables that make up the stock market, assertiveness can often end up depending on uncontrollable factors in simple linear logic" (Sousa & Rojo, 2010, p.118).

For this research, the Delphi technique was not applied since the critical variables were defined based on the general objective and the specific objectives: 1) Sources of financial market information, whether technical, qualitative, or quantitative; 2) Heuristics and Cognitive Biases; 3) Emotions.

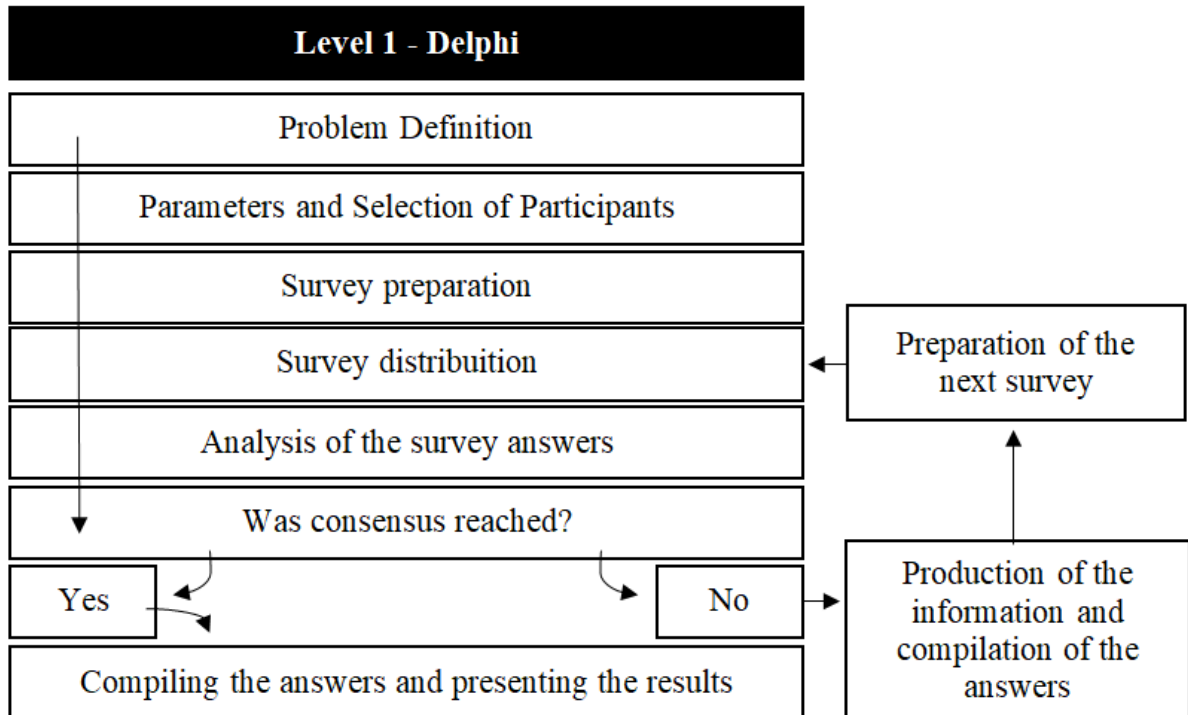


Figure 4: Level 1 - The Delphi method
Source: Adapted from Rojo (2006)

At level 2, the strategic diagnosis tools that compile critical variables (level 1) are chosen to generate scenarios (level 3). For the choice of tools, it is necessary to stick to "applicability considerations, such as own criteria, reliability, familiarity with the tool and other aspects deemed necessary to obtain the best possible diagnosis" (Rojo, 2006, p.40).

Within the context of the stock market, the tools chosen are the following: 1) Information Sources: investment advisory report, analyst opinion, influencers, and YouTubers; 2) Heuristics and Cognitive Biases: Heuristics and Biases Identification Form; 3) Emotions: Mapping and recording emotions, and Emotional Regulation Script.

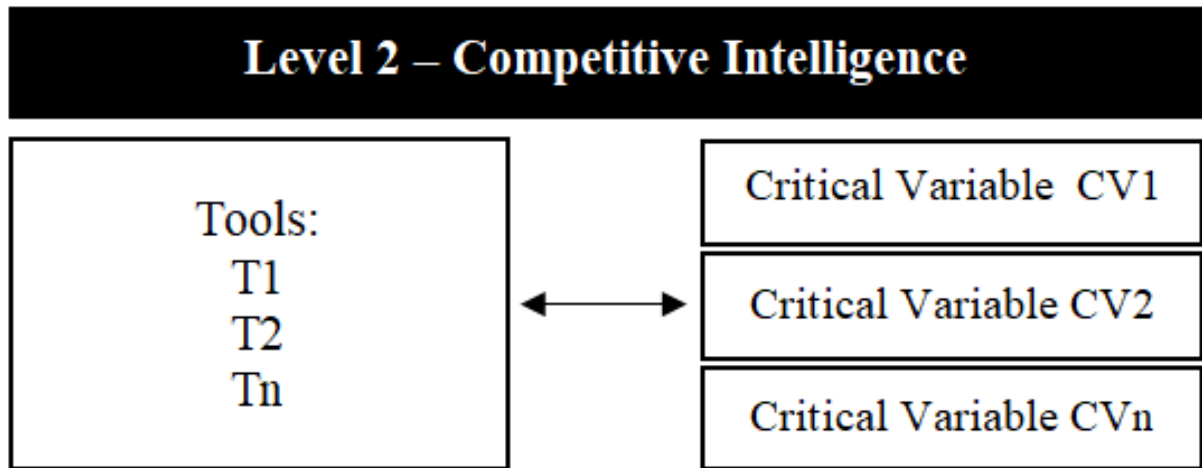


Figure 5: Level 2 - Competitive Intelligence
Source: Adapted from Rojo (2006)

At level 3, the simulation of scenarios occurs; through this technique, it is possible to "generate images and make possible events in anticipation of future situations, minimizing the element of surprise" (Rojo, 2006, p.102-103).

Based on the tools listed in level 2, the scenarios will be built taking into account the variables, that is, from the definition of the source and the information that the investor has about a certain stock, the influence of cognitive biases and emotions in decision-making is evaluated.

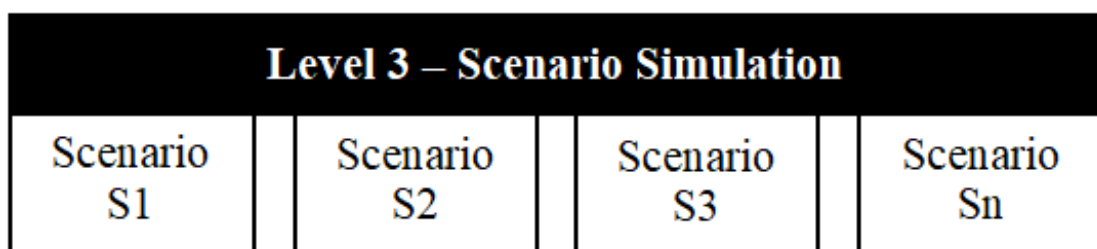


Figure 6: Level 3 - Scenario Simulation
Source: Adapted from Rojo (2006)

At level 4, the formulation of strategies is carried out as a function of the scenarios, focusing on the reduction of the risk factor when the scenario is modified by events. The formulation of strategies is conditioned to the objectives to be reached, and the solution to the problems encountered in each scenario.

Due to the variability and instability of the financial market, the scenario simulation needs to attain to the environmental influence and the need for "formulation of strategies to

achieve the goals within the context of uncertainties that is placed in the decision-making process" (Sousa and Rojo, 2010, p.119).

At this level, it is proposed to use the emotion regulation script, which could support investors in making their stock-buying decisions based on mapping emotion, heuristics, and cognitive biases.

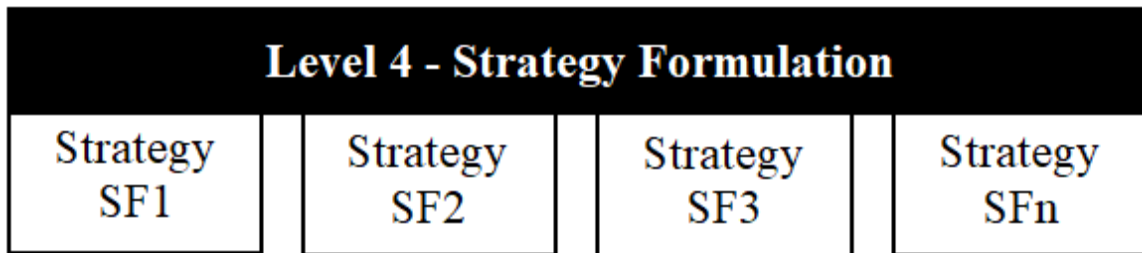


Figure 7: Level 4 - Strategy Formulation
Source: Adapted from Rojo (2006)

In the last level, level 5, the action plans are applied, that is, the actions defined during the process; based on mapping all the variables that interfere in the decision-making process, the investor can decide to buy and sell the shares.

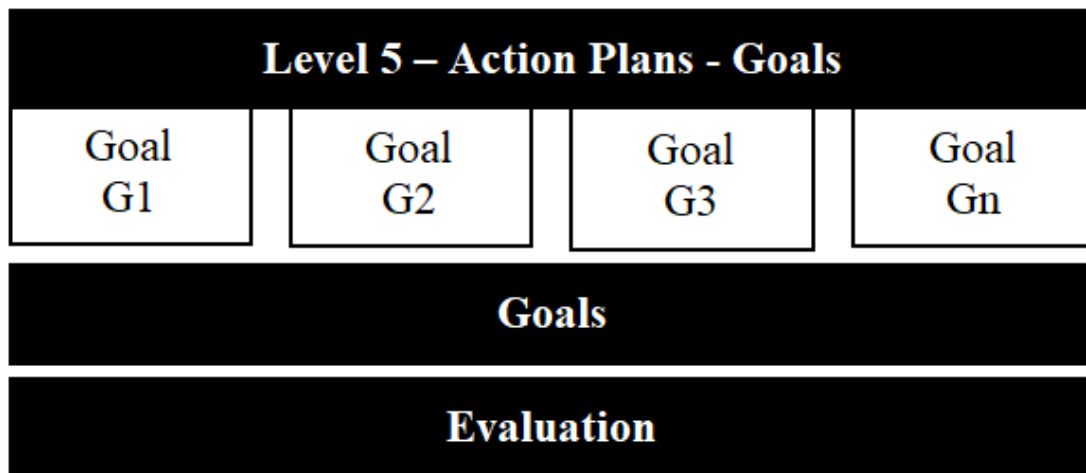


Figure 8: Level 5 - Action Plan
Source: Adapted from Rojo (2006)

The evaluation process of Rojo's Model is constant and applied at levels 2, 4, and 5, i.e., the process needs to be periodically reviewed to keep up to date, so investors must re-evaluate, returning to the beginning, seeking updates as needed on the critical variables that have shaped their scenario simulation system.

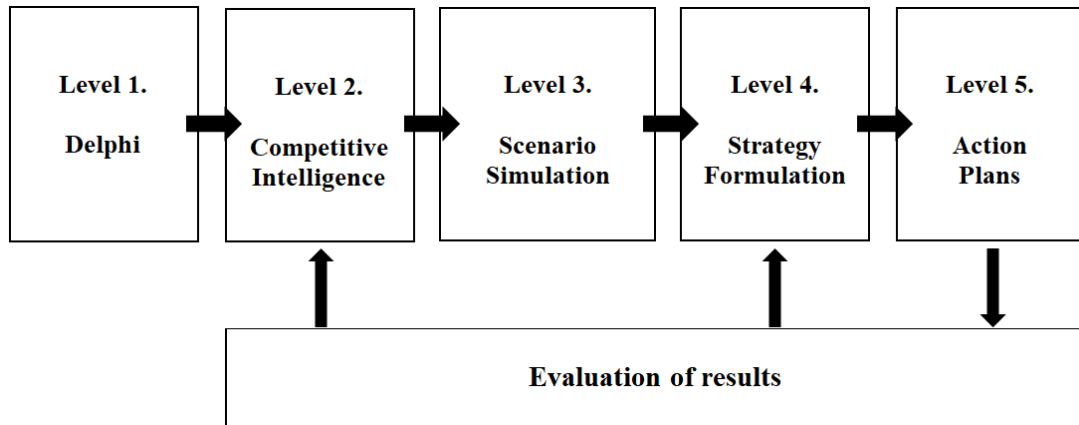


Figure 9: Evaluation

Source: Adapted from Rojo (2006)

Due to the dynamism and the volume of variables that form the stock market, the success in achieving results may be difficult to frame in simple linear logic (Souza and Rojo, 2010). Therefore, the definition of a scenario simulation model can enable and develop systematized approaches, providing the expansion of rational analysis possibilities and practical value for investors' decision-making.

Given the inability of the human mind to formulate and solve complex problems, if compared to the size of the problem, whose solution is required for objectively rational behavior in the real world or even for a reasonable approximation to such objective rationality (Simon, 1955), scenario simulation for investors can serve as a cyclical learning cycle type approach, emphasizing the learning process generated and its resultants for the individual investor to establish, from his preferences and skills, the "circle of competence, which is the accumulation of experiences over a lifetime" (Hagstrgom, 2008, p. 34), to invest based on greater knowledge and rationality.

2 RESEARCH METHOD AND TECHNIQUES OF TECHNICAL PRODUCTION

The methodological procedures adopted in this research aimed to describe the steps and guide the direction of the study with the focus of producing scientific content because the scientific method, its procedures, and rules assist in achieving an objective (Richardson, 2010).

2.1 RESEARCH DESIGN

As for the objectives, the research can be classified as exploratory-descriptive. This method is used in cases in which it is necessary to define the problem more precisely and is characterized by a flexible and unstructured research process. In this type of research, the sample size is small and non-representative, and the data analysis is qualitative. The findings are experimental, and the result is usually followed by further exploratory or conclusive research (Malhotra, 2001).

Regarding the nature, this research can be classified as qualitative. For Gil (1999), this approach provides the deepening of the investigation of issues related to the phenomenon under study and its relationships. According to Malhotra (2001), "qualitative research provides better insight and understanding of the context of the problem, while quantitative research seeks to quantify the data and applies some form of statistical analysis" (p.155).

As for the choice of the object of study, this research is defined by non-probability sampling, which provides good estimates of population characteristics (Malhotra, 2011). In addition, the costs and work involved in developing a sampling frame are minimized (Aaker, Kumar & Day, 2004).

2.2 DATA COLLECTION PROCEDURES

For data collection, the questionnaire tool was used. The use of this tool provides the standardization of the questions, which enables a more uniform interpretation of the respondents; this facilitates the compilation and comparison of the answers chosen (Malhotra, 2001).

The questionnaire was applied between October 17 and October 24, 2022, through the electronic tool Google Forms (according to Appendix A); in the survey, there are three sections of questions, containing closed questions of dichotomous choice, multiple, and scale with pre-defined information about the theme studied. Section 1 had the purpose of obtaining information regarding the respondents' profile, such as gender, age, marital status, education, and professional activity, in addition to collecting information regarding the investor profile and types of investments. Section 2 aimed to map the emotions and the intensity rating attributed to them by the respondents when they operate in buying and selling stocks. Finally, Section 3 sought to map heuristics and biases and the respondents' ability to simulate scenarios.

The snowball technique was used to collect information, considering that this technique is a form of non-probabilistic sampling in which reference chains are used (Vinuto, 2014). This technique was defined for convenience and for its wide possibility of indicating people with the desired profile, for the continuity of the sampling, members of the population of interest (Baldin & Munhoz 2011).

According to Malhotra (2001), convenience sampling seeks to achieve a sample of convenient elements. The selection of sample units is left largely to the researcher. According to Gil (2008), researchers select the elements to which they have access, assuming they can somehow represent their research universe. The sample universe corresponds to individual investors listed on B3 who have shares in their investment portfolios. Therefore, the population that forms this non-representative sample by convenience comprises 17 investors who answered the survey using the snowball technique. The type of investment delimited the respondents' profile for analysis, i.e., the respondent had to have stocks in his or her investment portfolio.

2.3 PROCEDURES AND DATA ANALYSIS

For data analysis, descriptive statistics were used, which, according to Mattar (2001, p.62), "aims to provide summarized information of the data contained in the total elements of the sample(s) studied." Descriptive statistics use measures of position, which characterize what is characteristic of the group, and of dispersion, to measure how the elements are distributed in the group.

3 ANALYSIS AND INTERPRETATION OF RESULTS

Among the 17 respondents in this survey, 14 are male and three are female. As for age, there was a variation between 18 and 55 years, with a greater concentration, 41.2%, between 36 and 45 years. Regarding marital status, 70.6% are married, 82.4% have a post-graduate degree, and 64.7% work formally under the Consolidation of Labor Laws (CLT, in Brazil).

As for the investor profile, respondents classified themselves as Moderate and Bold, Aggressive and Sophisticated, equally in 47.1% of the sample, while the Conservative classification was chosen by only 5.9% of respondents. The investor profile classification, determined by CVM, aims to establish criteria for financial agents in order to support the investor (CVM, 2021), because the investment needs to be appropriate to the objective and risk profile of each investor; otherwise, it may expose them to risks and losses above what they would be willing or able to assume (Puga, 2009; CVM, 2021; Investor Portal, 2021). However, no unified model exists, and each financial institution makes its classification questionnaire. Moreover, most questionnaires do not address behavioral issues, such as heuristics and biases, or emotional aspects that influence decision-making.

As for the composition, besides all of them investing in stocks, a criterion for participation in the survey, among the 17 participants, 88.2% have a Certificate of Deposit (CDB) and 58.8% have Agribusiness Letters of Credit (LCA); in addition, they also declared they have in their portfolios: Real Estate Credit Bill (LCI), Treasury Direct, Cryptocurrencies, Agribusiness Receivables Certificate (CRA), or Real Estate Receivables Certificate (CRI), Multimarket Funds, Savings, Index Universal Life USA, Derivatives, Commodities, Private Pension, and Real Estate Funds (FII). Generally, the less knowledge an investor has about investments and diversification, the more conservative his profile is. On the other hand, the greater their appetite for risk is, the greater their search for knowledge and understanding of the market (B3, 2020).

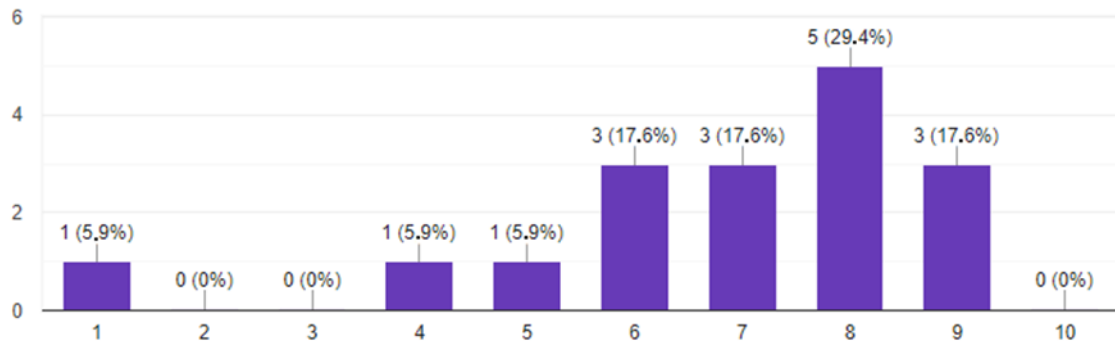
Most respondents, 58.8%, invest in stocks between 1 and 5 years, 17.6% between 6 and 10 years, and 23.5% for more than ten years. With regard to the number of shares in the portfolio, 41.2% of the respondents own more than ten shares, 29.4% own 3 to 5 shares, and 29.4% own 6 to 10 shares. The concentration of 58.8% of respondents, who invest in stocks between 1 and 5 years, corroborates the reports published by B3 about the growing increase of individual investors who have joined the stock market in the last three years (B3, 2021).

As for the frequency with which they buy and sell stocks, 58.8% of the respondents declared they buy and sell stocks sporadically; 35.3% once a month, and 5.9% declared they buy or sell stocks according to market movements. The mapping of the Profile of Individual Investors at B3, in December 2021, showed that individual investors were more active, that is, with a higher trading volume at the stock exchange. In 2020, the average number of investors who made at least one trade in the month reached 1 million investors; in the third quarter of 2021, this number jumped to over 1.5 million investors with at least one B3 trade in the period (B3, 2021).

As for the sources of consultation for decision-making on buying and selling stocks, 29.4% of respondents reported that they consult reports from analysis houses, and 23.5% reported that they get information from Instagram or YouTube influencers. The remaining respondents mentioned family, friends, advisors, and searches on websites using their own knowledge on the subject. For the selection and definition of the sources and tools of strategic diagnosis, according to the Rojo's Model of Scenario Simulation, it is necessary to consider the applicability and reliability to obtain the best possible diagnosis (Rojo, 2006). The respondents reported having, at the same time, several sources of consultation; this fact can, to some extent, hinder the decision-making process since the frequent alternation between sources and tools can hinder the construction of scenario simulation for decision-making.

Regarding identifying and classifying emotions when buying stocks, 88.2% of respondents said that they can identify, while 11.8% said they can sometimes identify. When asked to identify which emotion they were feeling at the moment, the majority, 47.1%, reported feeling joy; 11.8% reported feeling surprised, and the same percentage, 11.8%, reported feeling anxiety; the others reported: satisfaction, fear, apprehension, doubt, and uncertainty. This result corroborates the understanding that, among the types of emotions, those classified as primary: joy, sadness, fear, disgust, anger, and surprise (Pereira *et al.*, 2013), are the most recognized by individuals.

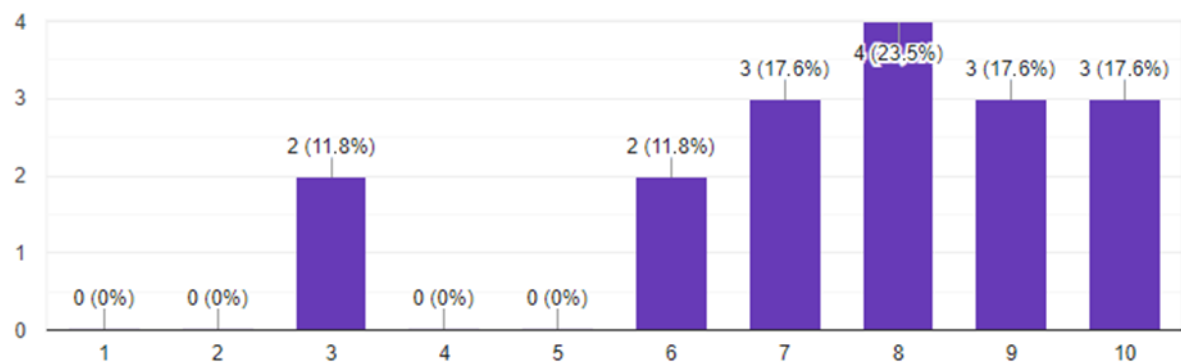
When asked to rate the emotion they were feeling at the moment, using a scale of 1 to 10, where 1 was the emotion felt with little intensity and 10, when the emotion was felt with a lot of intensity, the respondents presented the following answers, according to Graph 1:



Graph 1: Classification of the intensity of emotion at the moment
Source: Elaborated by the author (2022)

As can be seen in the graph, there was a concentration between intensity 6 to 9, with 29.4% of respondents rating intensity at 8 on the scale. Generally, "valuations' emotional responses involve changes in experiential response, behavioral response, and physiological systems" (Gross, 2008, p.499). In other words, the emotion triggered when buying stocks directly impacts these investors' response, behavior, and physiological reaction. Therefore, it is necessary to develop the ability to recognize emotions in order to establish emotional regulation, according to the modal model proposed by Gross (2008).

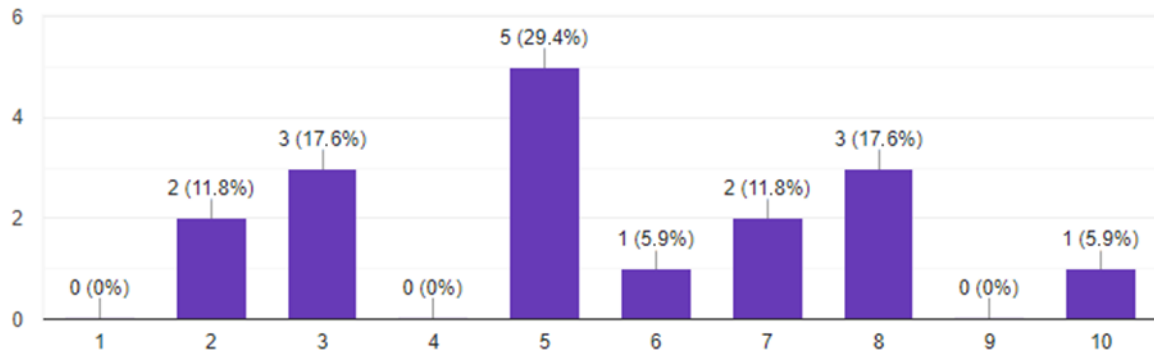
When asked to identify which emotion they felt most intensely when buying stocks for the first time, 41.2% of respondents stated that they felt joy, 23.5% felt fear, and 23.5% surprise; the rest reported anxiety as an emotion. When asked to identify the intensity of this emotion when they first bought stocks, using a scale of 1 to 10, where 1 is the emotion felt with little intensity and 10 when the emotion was felt very intensely, respondents provided the following responses:



Graph 2: Rating of the intensity of emotion when buying stocks for the first time
Source: Elaborated by the author (2022)

Graph 2 presents a concentration between intensity 6 to 10, with 23.5% of respondents rating intensity at 8 on the scale. Based on the neurobiological perspective, emotions always involve three aspects: a feeling (which can be of positive or negative valence), behavior (motor reactions characteristic of each emotion), and corresponding physiological adjustments (Fonseca, 2016). Therefore, it can be stated that when the intensity rating, on a scale of 1 to 10, focuses on intensity values of 6 to 10, the feeling was experienced with a high valence and both behavioral and physiological reactions accompanied that intensity.

When asked about what emotion they feel when there is a significant drop in the value of a stock in their portfolio, 23.5% of respondents said they feel fear, 17.6% feel sadness, 11.8% surprise, 5.9% anger, 5.9% anxiety, and the rest feel indifference. Emotions also influence "increased alertness, restlessness, pupil dilation, sweating, tearing, altered facial expression, among others" (Cosenza & Guerra, 2011, p. 76). When asked to identify the intensity of the emotion upon the expressive drop of a stock in their portfolio, using a scale of 1 to 10, where 1 is the emotion felt with little intensity and 10 when the emotion was felt with a lot of intensity, the respondents presented the following responses:



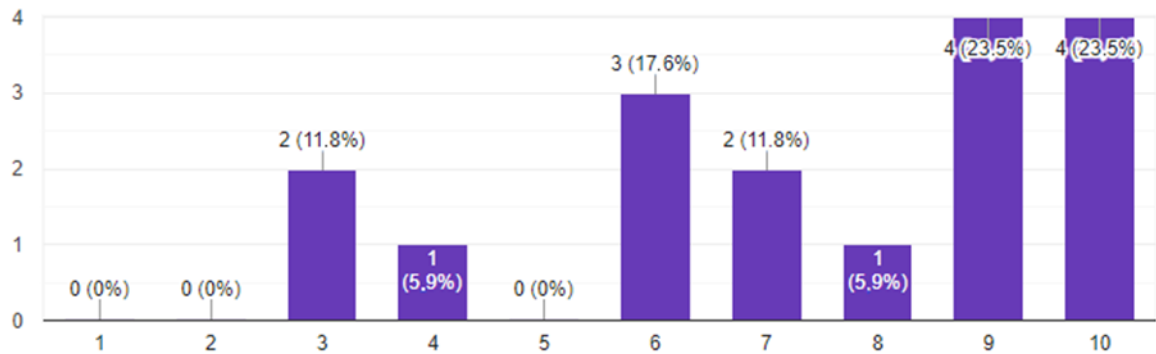
Graph 3: Classification of the intensity of emotion when faced with a significant drop in share value

Source: Elaborated by the author (2022)

As can be seen in Graph 3, 29.4% of the respondents rated the intensity at 5 on the scale. The concentration between intensity 5 to 8 demonstrates that the feeling was experienced with a medium to high valence and that both behavioral and physiological reactions possibly accompanied this intensity.

When asked about which emotion they feel when there is a significant rise in the value of a share of their portfolio, 82.4% of respondents said they feel joy; the others, with 5.9% each, reported surprise, anxiety, and indifference. When asked to identify the intensity of

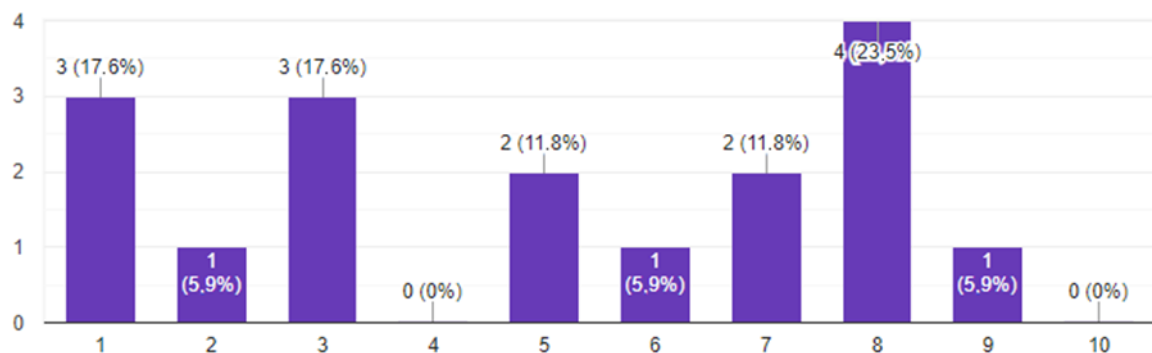
emotion when a stock in their portfolio goes up, using a scale of 1 to 10, where 1 is the emotion felt with little intensity and 10 when the emotion was felt with a lot of intensity, the respondents presented the following answers:



Graph 4: Rating of the intensity of emotion when faced with a significant rise in share value
Source: Elaborated by the author (2022)

As Graph 4 shows, there was a concentration between intensity 6 to 10, with 23.5%, at 9 and 10 intensity on the scale; again, there is high valence, in this case, a positive valence. Emotion can be understood as "a subjective experience accompanied by physiological manifestations (autonomic responses, commanded by the central nervous system) and detectable behavioral (motor responses)" (Lent, 2010, p.715-717).

Regarding anxiety when buying and selling stocks, 58.8% of respondents reported no, and 41.2% reported yes. When asked to identify the intensity of the anxiety emotion when buying and selling stocks, using a scale from 1 to 10, where 1 is the emotion felt with little intensity and 10 when the emotion was felt with a lot of intensity, the respondents presented the following answers:



Graph 5: Rating of anxiety intensity
Source: Elaborated by the author (2022)

Graph 5 shows that there was a spread across the scale with 17.6% for 1 and 2 and 23.5% for 8 intensity on the scale. The rating of the anxiety level between 5 and 8 for most respondents demonstrates that this emotion is present with high intensity when buying or selling stocks. The dispersion of classification between 1 and 9 may have occurred due to lack of recognition of the emotion or, then, due to characteristics that influence the decision-making of each investor (Katona, 1975) and the level of knowledge he has about the market.

In short, emotional states affect the decision-making process of individuals with regard to buying and selling stocks, since "positive emotional states, such as excitement, induce people to take risks and have confidence in their ability to evaluate investment options, while negative emotions, such as anxiety, have the opposite effects," i.e., "human emotional reactions seem to affect utility and therefore future choice" (Vieito *et al.*, 2015).

In Section 4, on Investment, questions 24 to 35 (the complete list of questions is in Appendix A) sought to investigate the heuristics and biases involved in the decision-making process, in addition to assessing how these investors act when faced with the evaluation and simulation of scenarios. In general, when faced with a difficult question, System 1 searches in its memory for information that is similar and can provide the answer, often an answer that does not correspond to what was asked, in case System 1 does not know the answer and System 2 is not triggered. This is because System 1 suppresses ambiguity and spontaneously constructs stories that are as coherent as possible (Kahneman, 2012, p.145-146). In general, people rely on a "limited number of heuristic principles that reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. In general, these heuristics are quite useful, but sometimes lead to serious and systematic errors" (Kahneman and Tversky, 1974, p.1124).

In question 24, the problem presented to the respondents required them to evaluate whether the amount paid for the share is a useful reference for buying or selling the shares. The result obtained, 76.5% for yes and 23.5% for no, shows that the Anchoring heuristic was present for 76.5% of the respondents, since the value paid for the share is not a useful reference. The same occurred in question 34, when 76.5% of the respondents continued to buy the company's stock, having only the previous values of the company's stock as anchor information. The bias "adjustment by anchoring is associated with the fact that the decision maker sticks to an initial value and, from there, take as a starting point such value to process comparisons that may lead him to make decisions that contradict the axioms of the Expected

Utility Theory" (Serra, Galeno, do Rosário Contani, Torralvo, & de Lourdes Marinho, 2010, p.6).

Question 25 (I prefer to invest in stocks that present a history of excellent yields) aimed to investigate the respondents' Representativeness heuristic. The results obtained for the question I prefer to invest in stocks that have a history of excellent returns were 64.7% for yes, and 35.3% for no; this fact shows that the respondents' decision is associated with the insensitivity bias to the basic indices, which are related to the stereotyping that occurs from associations between the information presented, ignorance on the subject and preconceived ideas by the decision maker (Serra et al., 2010, p.6).

In question 26, the objective was to investigate the Availability heuristic and the respondents' bias when faced with the information of a sudden drop in the stock market due to an unexpected event (for example, the pandemic). Among the respondents, 76.5% stated that they would buy stocks and 23.5% that they would both sell and buy stocks. No respondent opted to only sell shares. According to the Availability bias, "the ease and speed with which certain ideals arise in the mind of the decision maker, it is possible that he avails himself of this pocket rule and makes hasty decisions, which do not maximize the expected utility, among the available options" (Serra *et al.*, 2010, p.6).

Questions 27 and 35 were intended to check the respondents' decision when faced with a scenario simulation. In question 27, the respondents were asked to choose between deposit A and B. Considering a regular deposit (A) of \$500 for 240 months at a rate of 0.8% per month, a final amount of R\$363,450.13 is obtained. A deposit (B) of R\$500.00 for 240 months at a rate of 1.5% will yield R\$1,171,743.59; all respondents, 100%, chose deposit B. Investment is the commitment of money or other resources in the present with the expectation of reaping future benefits. It is possible to state that "scenario simulation is a cognitive tool that seeks to describe a certain situation about how the world or a specific situation might change in the future" (Rojo, 2006, p.81). In question 35, 76.5% of the respondents chose Investment B and 23.5%, Investment A; this demonstrates that scenario simulation contributes to the projection of investments, "considering as starting point the present moment and reaching a certain point in the future projection" (Rojo, 2006, p.81).

The problem presented in question 28 aimed to evaluate the representativeness heuristic and the chance misinterpretation bias, which was You started buying stocks starting with four different stocks. Each of them went down shortly after your purchase. As you prepare to make your fifth purchase, you think that you would be more successful this time,

since the last four were not. This is because probability says that there will be at least one hit out of five decisions. The majority of the respondents, 94.1%, said that this thought is incorrect and only 5.9% said it was correct, i.e. the majority of the respondents were able to correctly evaluate this question.

Questions 29 to 33 were extracted (and adapted to current currency) from Kahneman & Tversky (1974). These questions aimed to verify how the investor, the respondent of this research, would react when he or she was making gains or losses. To the extent that they are exposed to market operations, whether growing, or in constant volatility, people use the "different learning experiences, from these experiences, and, adopt rule-based or instance-based reasoning" (Vieito *et al.*, 2015).

In questions 29 and 31, 58.8% of the respondents chose Alternative B, and 41.2% chose Alternative A; this result reflects the behavior of economic agents in valuing the certainty of gain of Alternative B, to the detriment of the uncertainty of Alternative A, that is, the respondents "opted for a risk-averse behavior, preferring Alternative B, which presents 100% certainty of gain, although the expected gain was lower" (Serra *et al.*, 2010, p.7).

In question 30, 52.9% of the respondents chose Alternative A, i.e., expose themselves to risk, to the detriment of 47.1% of the respondents, who chose Alternative B, i.e., when they had to decide for a sure gain of \$3,000 and an 80% probability of earning \$4,000, the majority chose to take the risk. In question 32, the result of 64.7% for Alternative A and 35.5% for Alternative B reflects risk aversion in the gain domain and risk propensity in the loss domain. The same occurred in question 33, as 76.5% of the respondents chose Alternative A and 23.5% chose Alternative B, when most respondents, faced with a loss situation, chose the lowest possible loss. This result corroborates what "behavioral economists understand that the individual when making decisions, seeks to act based on their lived experiences, which are risk averse when faced with gain, however, are not averse to risk when faced with the possibility of loss" (Bulhões and Ghiggi, 2021, p.1).

Decision makers will seek to make their probability estimates compatible with their knowledge on the subject, the laws of probability, their own heuristics and biases (Tversky & Kahneman, 1974). The risk of error exists in any investment decision; however, if the investor raises the right and necessary information, monitoring will provide greater certainty (Rojo, 2014) in the decision process.

4 FINAL CONSIDERATIONS

Given the information obtained in this research regarding the profile of investors, it is noted that many are still inexperienced in the stock market, according to the B3 report. It is plausible to highlight the possibilities of mapping emotions, as well as the feasibility of regulating these emotions, in addition to mapping heuristics and biases, establishing simulations of scenarios, this paper proposes an Emotional Regulation Script (Appendix B), which includes these variables described, which have a direct impact on the decision-making process of investors.

Based on the results obtained in this research, the multiplicity of consultation source used by investors regarding the decision-making, the various definitions and classifications about the emotions and the report of anxiety at the time of purchase, in an intensity of 5 to 9 for most interviews, as well as the manifestation of anchoring heuristic in questions 24 and 34, the representativeness heuristic in question 25, and the aversion to loss in questions 29 to 35, it can be seen that there are several factors that influence an individual to make a decision when buying and selling shares. Furthermore, investor behavior is often influenced by emotions, heuristics, and biases, presenting flaws and limitations. The behavior of the interviewees validates, therefore, the theories presented throughout this work.

The study of human behavior, with respect to decision-making with investments involving risk, is of paramount importance, since the greater understanding of heuristics and biases that interfere in the decision-making process can contribute to improve judgments and reduce financial losses arising from an irrational decision (Reina *et al.*, 2009). Emotional mapping and regulation may contribute for the investor to influence the emotions he experiences, when they occur, so that he can make more assertive and less emotional decisions when buying and selling stocks.

Finally, for further studies, the implementation of the Emotional Regulation Script based on the Rojo Method of Scenario Simulation is suggested to be applied in a larger population, establishing control group and study group.

REFERENCES

- Aaker, D. A., Kumar, V., Day, G. S. (2004). Pesquisa de marketing. Tradutor: Reynaldo Cavalheiro Marcondes.
- Ackoff, R. L., Sasieni, M. W. (1971) Pesquisa Operacional. Rio de Janeiro: LTC.
- Andrade, E. L. D. (1989). Introdução à pesquisa operacional: métodos e técnicas para análise de decisão. *Rio de Janeiro: LTC*.
- Ariely, D., & Kreisler, J. (2019). *A psicologia do dinheiro: Descubra como as emoções influenciam nossas escolhas financeiras e aprenda a tomar decisões mais inteligentes*. Sextante.
- Associação Brasileira das Entidades dos Mercados Financeiros e de Capitais (2021). Suitability: entenda por que considerar seu perfil de investidor ao investir - *Como Investir* - ANBIMA. Available at: <https://comoinvestir.anbima.com.br/noticia/suitability-entenda-perfil-investidor>. Accessed on: Oct. 12, 2022.
- Bazerman, M. H. (2004). Processo decisório. Tradução da quinta edição.
- Bear, M. F., Connors, B. W., & Paradiso, M. A. (2002). *Neurociências: desvendando o sistema nervoso*. Artmed editora.
- Barrett, L. F., & Wager, T. D. (2006). The structure of emotion: Evidence from neuroimaging studies. *Current Directions in Psychological Science*, 15(2), 79-83.
- Brasil, Bolsa, Balcão. (2019). Ecosistema do Investidor Brasileiro. Disponível em: https://www.b3.com.br/pt_br/noticias/relacionamento.htm
- Brasil, Bolsa, Balcão. (2020). Uma análise da evolução dos investidores pessoas físicas na B3. Available at: https://www.b3.com.br/data/files/E6/75/BC/90/36ECA71068C61CA7AC094EA8/Estudo_PF-final%20mai.20.pdf
- Brasil, Bolsa, Balcão. (2022). https://www.b3.com.br/pt_br/market-data-e-indices/servicos-de-dados/market-data/consultas/mercado-a-vista/perfil-pessoas-fisicas/perfil-pessoa-fisica/
- Baker, H. K., & Nofsinger, J. R. (2002). Psychological biases of investors. *Financial services review*, 11(2), 97-116.
- de Brito, O. S. (2019). Mercado financeiro. Saraiva Educação SA.
- Bulhões, R., Ghiggi, D.. (2021). Escolhas do consumidor pela ótica comportamental. In: *Behavioral Science Lab Seminars*, São Paulo. Anais do Behavioral Science Lab, 2021.
- Chiavenato, I., Sapiro, A. (2003). Planejamento Estratégico: fundamentos e aplicações. 11ª Reimpr. Rio de Janeiro: Elsevier.
- Comissão de Valores Mobiliários (2021). Resolução CVM Nº 30, de 11 de maio de 2021. Available at: <https://www.in.gov.br/en/web/dou/-/resolucao-cvm-n-30-de-11-de-maio-de-2021-319483569>. Accessed on: July 12, 2021.
- Cosenza, R. M. N. (2011). Educação: como cérebro aprende/Ramon M. Cosenza y Leonor B. Guerra. Porto Alegre: Artmed.
- Damásio, A. (2012). *O erro de Descartes: emoção, razão e o cérebro humano*. Editora Companhia das Letras.

- Dorow, A., Júnior, J. S. M., Patrícia, N., Reina, D., & Reina, D. R. M. (2010). A heurística da ancoragem e a tomada de decisão sob risco em investimentos imobiliários. *Contabilidade Gestão e Governança*, 13(3).
- Fonseca, V. D. (2016). Importância das emoções na aprendizagem: uma abordagem neuropsicopedagógica. *Revista Psicopedagogia*, 33(102), 365-384.
- Fuller, R. J. (1998). Behavioral finance and the sources of alpha. *Journal of Pension Plan Investing*, 2(3), 291-293.
- Gil, A. C. (2008). *Métodos e técnicas de pesquisa social*. 6. ed. Editora Atlas SA.
- Gross, J. J. (2008). Emotion regulation. *Handbook of emotions*, 3(3), 497-513.
- Hagstrom, R. G. (2008). *O jeito Warren Buffett de investir*. São Paulo: Saraiva.
- Kahnema, D.; Slovic, P.; Tversky, A. (1974). *Judgment under uncertainty: heuristics and biases*. Cambridge: Cambridge University Press.
- Kahneman, D. (2011). *Rápido e Devagar: Duas Formas de Pensar*. Objetiva.
- Kahneman, D., & Riepe, M. W. (1998). Aspects of investor psychology. *Journal of portfolio management*, 24(4), 52-+.
- Hammond, J. S., Keeney, R. L., & Raiffa, H. (2017). *Decisões inteligentes: como avaliar alternativas e tomar a melhor decisão*. Alta Books Editora.
- Hastie, R. (2001). Problems for judgment and decision-making. *Annual review of psychology*, 52(1), 653-683.
- Katona, G. (1975). *Psychological Economics*. New York: Elsevier.
- Leahy, R. L., Tirsch, D., & Napolitano, L. A. (2013). *Regulação emocional em psicoterapia: um guia para o terapeuta cognitivo-comportamental*. Artmed Editora.
- Lent, R. (2010). Cem bilhões de neurônios-Conceitos Fundamentais em Neurociência. 2ª. Edição, Editora Atheneu.
- Linehan, M. M. (2018). *Treinamento de habilidades em DBT: manual de terapia comportamental dialética para o terapeuta*. Artmed Editora.
- Malhotra, N. K. (2001). *Pesquisa de marketing-: uma orientação aplicada*. Bookman Editora.
- Mayer, J. D., & Salovey, P. (1997). Emotional development and emotional intelligence. *Nova Iorque: Basics Books*.
- Sternberg, R. J., & Kaufman, S. B. (Eds.). (2011). *The Cambridge handbook of intelligence*. Cambridge University Press.
- Housel, M. (2021). *A psicologia financeira: lições atemporais sobre fortuna, ganância e felicidade*. Harlequin.
- Nofsinger, J. R. (2006). *A lógica do mercado: como lucrar com finanças comportamentais*. São Paulo: Fundamento.
- Pereira, W. R., Ribeiro, M. R. R., Depes, V. B. S., & Santos, N. C. (2013). Emotional competencies in the process of teaching and learning in nursing, from the perspective of the neurosciences. *Revista Latino-Americana de Enfermagem*, 21, 663-669.
- Pidd, M. (1998). *Modelagem Empresarial: ferramentas para tomada de decisão*. Porto Alegre: Bookman.

Portal do Investidor (2021). Available at: https://www.investidor.gov.br/menu/Menu_Investidor/funcionamento_mercado/Suitability.html. Accessed on Oct 12, 2022.

Plutchik, R. (1980). A general psychoevolutionary theory of emotion. In *Theories of emotion* (pp. 3-33). Academic press.

Puga, R. (2010). Formação de Investidores. *Coleção "Expo Money"*. Rio de Janeiro.

Dorow, A., Júnior, J. S. M., Patrícia, N., Reina, D., & Reina, D. R. M. (2010). A heurística da ancoragem e a tomada de decisão sob risco em investimentos imobiliários. *Contabilidade Gestão e Governança*, 13(3).

Richardson, R. J. (2010). Roteiro de um projeto de pesquisa. *RJ Richardson. Pesquisa social: métodos e técnicas*, 3, 55-67.

Robbins, S. P. (1998). Organizational behavior: concepts. *Controversies, Applications*, 1(8).

Rojo, C. A. (2005). Modelo para a simulação de cenários: uma aplicação em instituição de ensino superior privada.

Rojo, C. A. (2010). Simulação de cenários e a estratégia nos negócios. *CAP Accounting and Management-B4*, 1(1), 37-44.

Rojo, C. A. (2019). Investimento em ações Small Caps: cenários do mercado brasileiro. Cascavel, PR: Assoeste.

Rojo, C. A., Hoss, O., Sousa, A. F. D., & Lezana, Á. G. R. (2012). Finanças pessoais: o ouro do conhecimento de todos os tempos.

Rossoni, L. (2006). Modelagem e simulação soft em estratégia soft modelling and simulation in strategy. *Universidade Federal do Paraná-UFPR*.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, cognition and personality*, 9(3), 185-211.

Sbicca, A. (2014). Heurísticas no estudo das decisões econômicas: contribuições de Herbert Simon, Daniel Kahneman e Amos Tversky. *Estudos Econômicos (São Paulo)*, 44, 579-603.

Serra, R. G., Galeno, M. M., do Rosário Contani, E. A., Torralvo, C. F., & de Lourdes Marinho, B. (2010). Vieses comportamentais na decisão de investimentos: um estudo empírico. *Revista de Finanças Aplicadas*, 1, 1-23.

Silva, R. F. M. D., Lagioia, U. C. T., Maciel, C. V., & Rodrigues, R. N. (2009). Finanças Comportamentais: um estudo comparativo utilizando a teoria dos prospectos com os alunos de graduação do curso de ciências contábeis. *Revista Brasileira de Gestão de Negócios*, 11, 383-403.

Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics*, 69(1), 99-118.

Simon, H. A. (1996). *Models of my life*. MIT press.

Sousa, A. F. D., & Rojo, C. A. (2010). Análise de investimentos por simulação de cenários baseada em variáveis críticas qualitativas compiladas com Lógica Fuzzy. *Revista CAP Accounting and Management*, 4(4), 118-126.

Stoner, J. A. F.; Freeman, R.E. (1985). Administração. 5 ed. Rio de Janeiro: *Prentice Hall do Brasil*.

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral decision-making*, 12(3), 183-206.

Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *science*, 185(4157), 1124-1131.

Vieito, J. P., da Rocha, A. F., & Rocha, F. T. (2015). Brain activity of the investor's stock market financial decision. *Journal of Behavioral Finance*, 16(3), 220-230.

APPENDIX A – APPLIED SURVEY QUESTIONNAIRE

Welcome,

I count on your participation in this study on Scenario Simulation for Emotional Regulation of Stock Investors in the Post-Graduation program in Administration of UNIOESTE - Cascavel/PR.

Your answers will be treated confidentially and used only for academic purposes.

Time: about 10 to 15 minutes.

Alcinéia de Bortoli - Master's student PPGADM/UNIOESTE/PR -
alcineia.bortoli@unioeste.br

Prof. Dr. Claudio Antonio Rojo, Post-doctorate - Advisor

SECTION 1 - IDENTIFICATION

- 1) Full Name:
- 2) Gender: Female | Male | Other
- 3) Age: 18-25 | 26-35 | 36-45 | 46-55 | Over 55
- 4) Marital status: Single | Married | Other
- 5) Schooling: Elementary School | High School | Higher Educaion | Postgraduate
- 6) Professional activity: Formal Employee (CLT) | Self-Employed | Enterpreneur | Retired | Other
- 7) How do you classify your investor profile? Conservative | Moderate | Bold, Aggressive, Sophisticated
- 8) Which of these types of investments do you have?
CDB | LCI | LCA | Stocks | Tesouro Direto | Cryptocurrencies | CRA or CRI | Other
- 9) How long have you been investing? Less than 1 year | 1 to 5 years | 6 to 10 years | More than 10 years
- 10) Regarding diversification, how is your portfolio composed? 1 to 2 stocks | 3 to 5 stocks | over 5 stocks | over 10 stocks
- 11) How often do you buy and sell stocks? Every day | Once a week | Once a month | Sporadically or Rarely | Other
- 12) What sources do you use to decide about buying and selling your stocks? Reports from analysis houses | Financial Advisory | Influencer (Instagram | Youtube) | Friends | Family | Others

SECTION 2 - EMOTIONS

- 13) I can identify and classify my emotions when I am buying stocks: Yes | No | Sometimes
- 14) Which of the emotions below are you feeling most intensely AT THIS MOMENT?
- 15) Classify the emotion you are FEELING AT THIS MOMENT (on a scale of 1 to 10, where 1 the emotion is felt with little intensity and 10 the emotion is felt with a lot of intensity):
- 16) Which emotion below did you feel most intensely when you bought stocks for the FIRST time?
- 17) Rate your emotion WHEN YOU FIRST PURCHASED SHARES (on a scale of 1 to 10, where 1 the emotion is felt with little intensity and 10 the emotion is felt with a lot of intensity):
- 18) Which emotion below do you feel when there is an EXPRESSIVE DROP in the value of a stock in your portfolio?
- 19) Rate your emotion WHEN YOU FIRST PURCHASED SHARES (on a scale of 1 to 10, where 1 the emotion is felt with little intensity and 10 the emotion is felt with a lot of intensity):
- 20) What emotion below do you feel when there is an EXPRESSIVE HIGH in the value of a stock in your portfolio?
- 21) Rate your emotion when an EXPRESSIVE HIGH occurs in the value of a stock in your portfolio (on a scale of 1 to 10, where 1 the emotion is felt with little intensity and 10 the emotion is felt with great intensity):
- 22) Do you feel anxiety when buying and selling stocks?
- 23) Rate the anxiety you feel on a scale of 1 to 10, where 1 the emotion is felt with little intensity and 10 the emotion is felt with a lot of intensity:

SECTION 3 - HEURISTICS, BIASES, AND SCENARIO SIMULATION

- 24) Is the amount paid for the stock a useful reference for buying or selling the stock?
Yes or No
- 25) Do I prefer to invest in stocks that have a history of great returns? Yes or No
- 26) After a sudden unexpected drop in the stock market due to an event (for example, the pandemic), you: buy stocks | sell stocks | buy and sell stocks
- 27) Considering a regular deposit (A) of R\$500.00 for 240 months at a rate of 0.8% per month will yield a final amount of R\$363,450.13. A deposit (B) of R\$500.00 for 240 months at a rate

of 1.5% will yield a final amount of R\$1,171,743.59. Which one do you choose? Deposit A or Deposit B

28) You started buying stocks starting with four different stocks. Each one went down shortly after your purchase. As you prepare to make your fifth purchase, you think that this time you would be more successful, since the last four were not. For probability says that there will be at least one hit out of five decisions. This thought is: Correct | Incorrect.

29) Which of the two alternatives do you prefer?

Alternative A: 33% chance of winning R\$ 2,500, 66% chance of winning R\$ 2,400, 1% chance of winning R\$0

Alternative B: 100% chance of winning R\$2,400

30) Which of the two alternatives do you prefer?

Alternative A: 80% chance of winning R\$4,000 and 20% chance of winning R\$0

Alternative B: 100% chance of winning R\$3,000

31) Which of the two alternatives do you prefer?

Alternative A: 45% chance of winning R\$6,000, 55% chance of winning \$0

Alternative B: 90% chance of winning R\$3,000, 10% chance of winning \$0

32) Which of the two alternatives do you prefer?

Alternative A: 50% chance of losing R\$1,000, 50% chance of losing \$0

Alternative B: 100% chance of losing R\$500

33) Which of the two alternatives do you prefer?

Alternative A: 80% chance of losing R\$4,000 and 20% chance of losing R\$0

Alternative B: 100% chance of losing R\$3,000.00

34) A company in year 1 had its stock worth around R\$0.03 reais, in year 4 it went to R\$12 and in year 5 R\$27.42, suffering a great fall, and in year 7 it went to around R\$5.80. Given this scenario, would you continue to buy shares of this company? Yes | No

35) Considering an investment (A) of regular contribution of R\$500 for 240 months, with a rate of 0.8% per month with a credit guarantee fund, and, an investment (B) of regular contribution of equal value and time, with higher risk that pays only 3% per year of dividends, but has a potential of appreciation of 15% per year without guarantees of profitability and without a credit guarantee fund. Which one do you choose? Investment A or Investment B

APPENDIX B – EMOTIONAL REGULATION SCRIPT

Steps of the Emotional Regulation Script:

1. IDENTIFICATION AND DESCRIPTION OF THE EMOTION

How would you describe your emotional state at the moment?

Example:

Date	October 3, 2022
Situation	First stock purchase
Emotion rated from 0 to 10	Anxiety 9 Fear 7
Thoughts	Am I making the right choice?
Physiological Response	Mild tachycardia
Behavior	Stock Purchase
Consequence	Recurring thought about whether I made the right purchase.

2. EMOTIONAL REGULATION QUESTIONNAIRE - ERQ

J. Gross & O. John's Emotional Regulation Questionnaire (2003)

Adapted for the Brazilian population by Ana Caroline Boian, Dayane Suelen de Moraes Soares, and Jailson Lima (2009).

The Emotional Regulation Questionnaire was designed to assess individual differences in everyday use in two strategies to understand emotions.

Instructions:

We would like to ask you some questions about your emotional life, in particular, how you control your emotions (that is, how you regulate and lead). The questions below involve two different situations about your emotional life. The first refers to your emotional experience, that is, the way you feel. The second refers to emotional expression, that is, the way you demonstrate your emotions, by speaking, gesturing, or acting. Although some questions seem similar, they differ in important aspects. For each item, please answer using the following scale:

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7
 Strongly Disagree Neither agree nor disagree Strongly Agree

1. ___ When I want to feel more positive emotions (like joy or contentment), I change what I am thinking.
2. ___ I keep my emotions to myself.
3. ___ When I want to feel less negative emotions (like sadness or anger) I change what I am thinking.
4. ___ When I am feeling positive emotions, I am careful not to express them.
5. ___ When I am faced with a stressful situation, I try to think in a way that helps me stay calm.
6. ___ I control my emotions by not expressing them.

7. ___ When I want to feel more positive emotions, I change what I am thinking about the situation.
8. ___ I control my emotions by changing the way I think about the situation I am in.
9. ___ When I am feeling negative emotions, I try not to express them.
10. ___ When I want to feel fewer negative emotions, I change the way I am thinking about the situation.

3. APPLICATION OF THE STEPS OF EMOTIONAL REGULATION PROPOSED BY GROSS (2008)

Situation selection, situation modification, attention deployment, cognitive change, and response modulation.

3.1. RESPONSE MODULATION

JACOBSON'S PROGRESSIVE RELAXATION TECHNIQUE

Guidelines: Sitting comfortably in a chair or lying down, practice contracting and relaxing each of the major muscle groups listed below. Hold the tension for 4 to 8 seconds as you contract each muscle group. Bring full awareness to the tension. Then release the tension in that muscle, bringing your awareness fully into the feeling of relaxation. Remember that relaxation is a skill that requires practice.

Muscle groups: Left and right foot; Left and right calf; Left and right quadriceps; Abdomen; Buttocks; Left and right hand and forearm; Left and right biceps; Shoulders; Chest; Back; Neck; Mouth; Face.

DIAPHRAGMATIC BREATHING EXERCISE

Practicing diaphragmatic breathing is recommended while lying down or sitting up. To ensure that you are breathing correctly, you can place one hand on your chest and the other on your abdomen. To begin, breathe in normally through your nose. As you inhale, think about sending the air into your belly or diaphragm, deflecting it away from your chest. Feel your abdomen expand. As you exhale, feel your abdomen become flat. Extend the exhale before breathing in again. The sensation should be comfortable. There is no need to pause between inhaling and exhaling. Continue to breathe in this way for at least 3 minutes.

4. MAPPING HEURISTICS AND BIASES BASED ON THE TABLE ADAPTED FROM BAZERMAN (2004)

5. SCENARIO SIMULATION ACCORDING TO ROJO'S MODEL (2006)