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BEHAVIORAL FINANCE – A QUALITATIVE APPROACH FOR THE BRAZILIAN INVESTOR

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Abstract: One of the main debates in the economic sphere of Finance concerns the assumptions made by its more traditional theories, such as: Expected Utility Theory (TUE) and Efficient Markets Hypothesis (HME), the result of studies by Fama (1970) and Markowitz (1952), respectively. Specifically, issues related to the rationality of investors and economic agents. In this context, several studies have emerged with the aim of improving the dominant theoretical models, inserting to them behavioral aspects that were previously disregarded. These researches gave rise to a new and important field of study called behavioral finance, which began with Simom (1978) and later continued by Kahneman and Tversky (2002), followed by Sunstein and Thaler (2017), chronologically. The remarkable growth of this approach, which brings emotional and irrational human aspects, such as heuristics and biases, into finance theory, has been motivated, in particular, by the attempt to explain a series of phenomena regularly observed in the financial market, in in the decision-making process and that are incompatible, in part, with the theories of classical models of finance.
Keywords: Behavioral Finance; Heuristics; biases; Decision Processes.

INTRODUCTION

For many decades, modern finance theory has relied on concepts and assumptions that presuppose an efficient market. The Efficient Market Theory was developed and perfected by Eugene Fama in the 1960s and 1970s, using the Expected Utility Theory (TEU) as a basis for evolutionary development (FAMA, 1970).

However, there are several inconsistencies historically found in the financial market and in the decision-making process of economic agents that cannot be fully explained by neoclassical economics, through the assumptions of unlimited rationality of economic agents, as well as in their mathematical models (FAMA, 1998).

This way, it is possible to identify some anomalies in the financial market, which show a limited rationality of the human being, demonstrating the need to have a more comprehensive view of the causes of their behavior. The human logic described by the Theory of Expected Utility by Fama (1970) and by the Efficient Markets Hypothesis by Markowitz (1952), limits the understanding of behavior, not only of man, but of his environment (FRIES, 2017).

Some of the pioneers in behavioral finance studies were the psychologists Daniel Kahneman and Amos Tversky (1979). Their research on economic psychology resulted in some extremely relevant economic concepts, from a practical and academic point of view, which earned Kahneman the Nobel Prize in Economics in 2002 (KAHNEMAN; TVERSKY, 1979).

Kahneman and Tversky (1979) mention that investors in the financial market tend not to accept losses, keeping themselves in losing positions and quickly getting rid of winning positions. So economists believed that people were always risk averse and chose the safest. However, studies by Kahneman and Tversky (2000) found different data, showing that

people accepted to take more risk, as long as it was to try to obtain more attractive returns.

This is because emotions linked to fear of loss affect the way people make decisions. So they risked until they lost more, trusting another chance to avoid the loss. With this, researchers developed their theories addressing that financial behavior is not fully rational (FRIES, 2017).

RESEARCH PROBLEM

This work intends to answer some questions such as: a) What was the importance that studies in Economics and behavioral finance had to shape the new concept of being economic? b) What is the impact of mental heuristics and cognitive biases on the decision-making process of investors and economic agents?

PURPOSE

MAIN PURPOSE

This study has, in general, the objective of promoting an updated review of the aspects of traditional finance and behavioral finance, consolidating the main arguments of both parties and analyzing the degree of importance of the behavioral aspect for the evolution of economic science and its complexities.

DELIMITATION

This work does not aim to prove the non-existence of the rationality proposed by the Theory of Expected Utility Fama (1970) or by the Efficient Markets Hypothesis Markowitz (1952). But rather, to present that there is a new line of thought that can lead to a broader and more complete understanding of man as an economic being.

RELEVANCE

Understanding the topic of behavioral finance is helpful in identifying what is at risk when making decisions about how, where and how much to invest. In this sense, it is possible to control emotions and analyze situations more rationally, to avoid errors caused by behavior patterns. Which are usually adopted unconsciously. (Thaler; Sunstein, 2019)

THEORETICAL REFERENCE

CLASSICAL THEORY OF FINANCE

According to Famá, Cioffi and Coelho (2008) the evolution of finance theory can be characterized following the traditional approach to finance, widely applied in the 1920s and 1930s (focused on external aspects of companies and fundraising) and in the 1940s. (focused on the internal aspects of economic-financial performance companies), and on the modern approach to finance theory, initially applied in 1950 and used until the present day, which synthesizes the aspects observed in analyzes of corporate investments, capital structure, generation wealth, risk-return ratio, and risk management.

The concept of man as a being of unlimited rationality is what guides the studies of neoclassical economics present in the main schools. The concept of *homo economicus* constructed by these fronts is that of a being of unlimited rationality capable of quickly and efficiently perceiving all available information, thus being able to make the best decisions and choose the utility function that best suits him. will bring satisfaction and well-being (FRIES, 2017). According to Figueiredo (2013), orthodoxy (neoclassical economics) sees human behavior aimed at achieving a state of balance between its needs and choices.

THEORY OF EXPECTED UTILITY (TUE)

To start this approach regarding the main concepts of neoclassical economics, it is necessary to bring some understandings in relation to the Theory of Expected Utility

(TEU), as it served as an inspirational basis for the other theories that emerged in this neoclassical period of economics.

The Swiss mathematician Daniel Bernoulli, in the 18th century, created the (TUE), starting to argue that the value that a person attributes to his wealth is not its own monetary value, but its utility (CUSINATO, 2003). According to Bernoulli, price cannot be the measure that determines the value of an asset, but the utility it has. This way, the price of an asset depends on the asset itself. And this one is the same for everyone. However, the asset's utility for each individual will depend on the scenario in which it was estimated.

Bernoulli, for not being able to understand if the principle of mathematical expectation was effectively correct and also, for what reason the individual sought to insure his goods, he was motivated to develop the Theory of Expected Utility (1938 apud CUSINATO, 2003, p. 20).

Thus, the author reports that the initial milestone of the TUE occurred in the publication of his cousin Jonas Bernoulli, when he published the St. to hit which move will appear the "heads", betting to see who wins, as if it were a game. This way, he presents the question that, according to the principle of mathematical expectation, these players would be willing to pay at most the value of mathematical expectation (SILVA; PIENIZ, 2019).

THEORY OF EFFICIENT MARKETS (HME)

Modern financial models assume that prices efficiently incorporate all available information and are the best estimate of the real value of the assets to which they refer. The "efficient markets hypothesis" (HME), which was mainly part of the studies carried out by Fama (1970) and widely disseminated in the area of finance, is actually the incorporation of the restrictive hypotheses of neoclassical economists in the modeling of the financial world. Fama (1970), in short, defined that an efficient market, in a simplified way, is one in which each asset price reflects all available information about that asset and, based on that, markets must always be in equilibrium.

The efficient markets hypothesis works through two pillars: the theory of expected utility and the expectations of rationality. Through these two pillars, the HME affirms that all individuals are considered rational and that they can maximize their choices, after accurately analyzing the probabilities and future events, when subjected to uncertain choices.

The classical theories of finance were built based on economic assumptions, where the central premise is the rationality of investors and economic agents, which presuppose that the decision maker has absolute knowledge of all options and that all information is readily available. egalitarian way in the market, which leads him to consider the options and choose the best one, according to criteria and objectives determined by him (SIMON, 1979).

MODERN PORTFOLIO THEORY

In 1952, Harry Markowitz published in the Journal of Finance his article "Portfolio Selection", creating Portfolio Theory. In this study, the author mathematically demonstrates how the diversification of investments, with the purchase of several stocks or other assets (portfolio), can be used to reduce the risks of isolated stocks, in addition to providing projections of the expected return for a given portfolio.

Markowitz (1952), in the development of modern portfolio theory (MTC), which is the basis of several well-known financial models, such as William Sharpe's Capital Asset Pricing Model (CAPM), uses some assumptions from the HME. Markowitz (1952) published

the article "Portfolio Selection" addressing the principles of portfolio theory. The study sought to compose a portfolio of Financial Assets, optimizing the profile of the investor in relation to the risk and expected return. Markowitz presented in his work a model focused on determining these portfolios, maximizing the expected return, given a level of risk, and minimizing the risk, given a level of expected return.

It is possible to perceive in the theory proposed by Markowitz (1952), that the author never intended to completely eliminate the existing risk. There are several variables that can positively or negatively influence any investment, including situations that mathematical models are not able to predict.

Thus, the greatest legacy regarding the Markowitz model is that, in this model, it is possible to build investment portfolios in which the portfolio risk is lower than the lowest risk asset in the portfolio. The model also shows that most efficient combinations are formed by diversified assets. These important results, which contributed to the advancement and creation of other studies, make the Portfolio *Selection article* one of the greatest classics of modern finance theory.

CAPITAL ASSET PRICING MODEL (CAPM)

The Capital Asset Pricing Model (CAPM) by William Sharpe (1964) and John Lintner (1965) was a significant milestone in terms of asset pricing theory, earning Sharpe the Nobel Prize in 1990. Currently, the model it is still widely disseminated and applied in estimating the cost of capital of companies and evaluating portfolios (Fama and French, 2006).

The model is based on Harry Markowitz's Portfolio Theory, developed between 1952 and 1959. It is noteworthy that the development of this model made it possible for Markowitz's ideas to be simplified (BROWN; WALTER, 2012).

According to Mouck (1998), the expansion of the accounting paradigm was driven by the creation of the asset price model (CAPM). The model established a potential relationship between accounting gains and fluctuations in asset (stock) prices. In accordance with Markowitz's (1952) modern portfolio theory (MTC), it demonstrated how rational economic agents can make decisions that optimize the possibilities of lifetime consumption. Both models allow a theoretical link between accounting information and neoclassical economic theories.

CRITICISM OF THE CLASSICAL THEORY OF FINANCE

The emergence of the first criticisms of Neoclassical Finance took place from the empirical observation that demonstrated that the prices of some assets, at certain times, could present trends and this contradicts the hypothesis of market efficiency. These trends were called anomalies. For Shiller (2000), an anomaly is statistical evidence of incorrect determination of asset prices by the market (Costa, 2009).

One of the pioneering studies on these anomalies was carried out by Roseff and Kinney (1976), where they were able to observe that the American stock market in the months of January systematically presented an average return higher than the other months of the year, which showed that there was a tendency for the stock market to show higher profitability in January compared to other months of the year (Costa, 2009).

Kahneman and Tversky (1979), who worked on studies related to the behavior of economic agents in the decision-making process, identified situations in which individuals made decisions with biases that removed their full rationality. This contradicted the basic assumptions of the theory of efficient markets,

which considered that decisions were always made rationally (Macedo Jr, 2003).

Tversky and Kahneman (1974) state that agents tend to simplify the decision-making process and, in an attempt to make the task simpler and faster, make use of biased "mental shortcuts" or heuristic "rules of thumb" to make decisions. According to the researchers, this could lead decision makers to make systematic and serious mistakes. The possibility that investors make systematic errors, such as overconfidence, disagrees with assumptions established in classical finance theory (Macedo Jr, 2003).

Researchers argue that these limitations, inherent to human nature, can cause economic impacts, such as systematic and significant price deviations from the "real value" of financial assets (Rogers; Ribeiro; Securato, 2007).

BEHAVIORAL FINANCE THEORY

As demonstrated in this work, the models of the Classical Theory of Finance are based on the concepts of unlimited rationality of economic agents, where the investor's utility function is fully maximized. However, according to Anache (2008) during the period of evolution of studies in the economic and financial spheres, other studies emerged, which will be pointed out later, led by another line of thought where the decision-making process has a limited rationality, taking many economic entities to make wrong decisions. Because these would be subject to aspects related to human behavior, such as biases and heuristics. These studies are called finance or behavioral economics.

Simon (1966) was one of the first to disagree with the assumption of unlimited rationality, adding limits to full rationality in order to make decision-making models closer to reality. According to this author, optimal decisions can be costly and the search for "satisfactory solutions" becomes natural.

The most relevant work in the area of behavioral finance was published in 1979 by researchers Daniel Kahneman and Amos Tversky, with the title "Prospect Theory: analysis of decision under risk". In this study, the authors investigated the behavior and decision-making process of economic agents in situations involving the risks present in the financial market (PASSOS; PEREIRA; MARTINS, 2012). From the results obtained, the Prospect Theory was developed, through which the authors incorporated heuristic judgment in the investors' decision process. This work was so representative that Kahneman was awarded the Nobel Prize in Economics in 2002. Since then, studies involving behavioral finance have gained greater space and prominence in the academic sphere of economics.

According to Rogers, Ribeiro and Securato (2007), Prospect Theory, the result of studies by Kahneman and Tversky (1979), aims to explain cognitive biases and mental heuristics in the decision-making process of economic agents.

PROSPECTUS THEORY

Prospect Theory, also known as Prospect Theory, was developed by Kahneman and Tversky (1979) and is a concept of cognitive psychology that manages to relate decision making in the economic and financial spheres. According to the theory, people, in this case economic agents, make choices based on the potential gains and losses related to their assets in the financial market and this way the theory is based on the tendency that all people have within them a inherent risk aversion.

TUE is an axiom theory, while Prospect Theory is descriptive and developed by inductive means, from empirical evaluations (Kahneman and Smith, 2002). Knowing this, we can say that individuals have difficulties

to evaluate all the information available in the decision-making process and because of this they choose some variables as a basis for making their decisions.

Unlike TUE, Prospect Theory does not deduce about the market and its agents, but rather tries to find a conclusion or explanation for the reason and causes of events in the financial market through tests and finally understand the behavior of those who make the decisions. On the other hand, the TUE aims to show what would be the best decision to be taken in the market. Finally, another clear difference between the two theories is that TUE understands that a gain and a loss of equal values have the same weight for agents, while Prospect Theory understands that agents prefer to avoid a loss than to try to obtain a gain, thus deducing that they feel the loss more than the gain (Kahneman and Tversky, 1979). This relationship can be seen through the figure below, where the reference point can be interpreted as the point where x=0 and the shape of the value function would be concave for gains and convex for losses, with the slope being steeper for the losses, which demonstrates that the choices are more inconsistent (Falleiro, 2014).

Prospect theory tells us that decision making has two phases (Kahneman and Tversky, 1979). Initially, the problem is faced and filtered according to heuristic principles and rules of the individual, to simplify decision making. After editing the prospects, the decision maker assigns values to each of them and chooses the prospect with the highest value (Falleiro, 2014).

BEHAVIORAL ASPECTS, BIASES AND HEURISTICS

Behavioral human aspects are influenced by several psychological issues that can distort the identification and perception of facts, leading economic agents to decisions based on individual judgments, in which the rationality posed by the theory of expected utility may not be fully obeyed. Next, some behavioral aspects that can impact the decision-making process of economic agents will be presented. Some cognitive biases and mental heuristics, such as: loss aversion bias, overconfidence bias, representativeness heuristic and anchoring heuristic (Kimura; Basso; Krauter, 2006).

According to Kahneman and Tvsersky (1974), mental shortcuts are pocket rules, or practical rules called heuristics, used

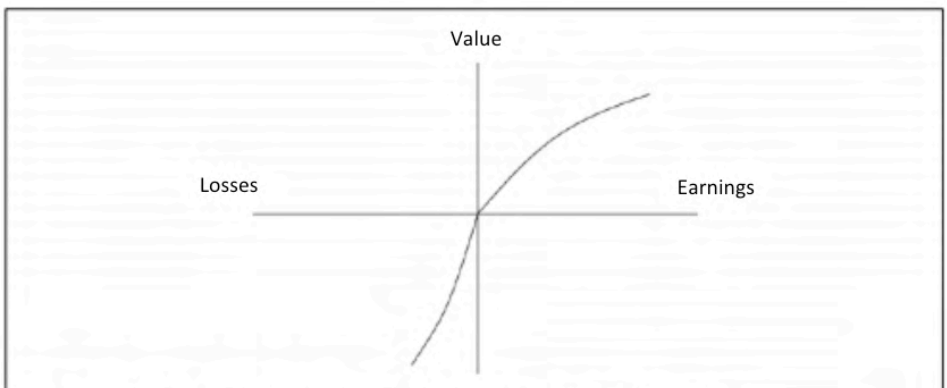

Figure 1- hypothetical value function, adapted from Kahneman Tversky, 1979)

SOURCE: : BARROS; FELIPE, 2015, p. 8.

involuntarily. The uninformed use of these rules of thumb can lead individuals to make decision mistakes. These errors are systematic and predictable cognitive failures, called cognitive biases, which can lead the decision-making agent to make wrong or inefficient decisions.

LOSS AVERSION BIAS

This bias is fundamentally based on Prospect Theory, this theory is opposed to the microeconomic concept called Expected Utility Theory (TUE), where the "UTILITY" scale measured the utility of results from the individual's degree of wealth. The Prospect Theory measures the "VALUE" function from a reference point and deviations from it, allowing gains and losses to be interpreted in different ways (Falleiro, 2014).

The main concept that behavioral finance addresses is that of "loss aversion". This concept says that people are not risk averse, they are loss averse. People prefer not to suffer the pain of loss to the pleasure of an equivalent gain, that is, it is preferable not to lose R$100.00 to gain R$100.00. They also take risks when they are losing, but are totally risk averse when they are winning (Araújo e Silva, 2007, p. 49).

OVERCONFIDENCE BIAS

The overconfidence bias causes the individual to have excessive confidence in their own opinions and knowledge, in addition to maximizing their individual contribution to decision making, tending to believe that they are always correct in their choices and justifying the decisions with external factors. any errors. This way, individuals identify themselves as better than the general average, and this bias is also known as *overconfidence* (Moreira, 2012).

REPRESENTATIVENESS HEURISTIC

The representativeness heuristic takes into account the degree of similarity between an event and its sample. Thus, there is a high probability of classifying a person by the clothes he is wearing. For example, if you are wearing a cassock, there is a good chance that you are a priest. If you're wearing a suit and tie, you have the possibility of being an executive or lawyer. For the most part, the fact refers to some typical case that, generally, does not reveal anything about the person. She may be wearing clothes that do not define, for sure, what her profession or way of life is (SILVA, 2018).

These perceptions, often mistaken, can lead individuals to so-called "mental traps", creating unfounded causal relationships that resemble each other, but that are lost when the cause and effect are very different (SILVA, 2018).

According to Kahneman and Tversky (1974) the Representativeness Heuristic concerns the tendency of individuals to focus their attention on specifics that may have some relation to stereotypes created previously when making a judgment in decision making.

ANCHORING HEURISTICS

The anchoring heuristic, according to Macedo Jr. (2003), concerns the tendency that individuals have to project estimates from an initial point. It occurs when, for example, stock price levels reach certain values and form an "anchor" in investors' minds, interfering with their decisions to hold or sell the asset at that purchase price. This tendency ends up making it difficult to modify the investor's initial thinking, leading him to adjust this judgment to the new information received.

This heuristic becomes a dangerous trap for the economic agent because it establishes one in a kind of psychological support, causing the agent to make his decisions according to this support. It is possible to perceive this pattern, when, for example, there is a stock that is

being negotiated at its historical minimum price and the investor buys this asset in the expectation that it will not continue to depreciate. The problem is that, many times, the stocks continue to fall and the investor can end up having losses due to the fact of having been a victim of this mental shortcut (SILVA, 2018).

IMPACTS ON THE DECISION-MAKING PROCESS

According to Lindenberg (2010), the decision-making process is a process of continuous ideas that is influenced by the difficulties of the problems, the knowledge related to it, the situation in which it finds itself and the attributes of the agents involved. As stated by Simon (1970), decision-making is a process in which the available alternatives must be analyzed and the most appropriate for the decision-maker's objective must be chosen.

Steiner (1998) adds that heuristics can also be seen as practical rules and simplifying strategies to be able to go through a complex environment and facilitate the judgment process and make choices due to the speed and agility of their application.

METHODOLOGY

According to Malhotra (2006), research is a scientific method where the basic premise is the researcher's objectivity. It must be done in an impartial way so that the information collected and described reflects the truth and there are no personal or political biases. The main objective of research is to discover answers to problems through the use of procedures.

On this topic, a bibliographic review was carried out focusing on the main articles and academic texts on the subject, in order to give the reader a historical approach to this issue along the theoretical framework.

CONCLUSION

The objective of this study was to demonstrate the practical applications of behavioral finance and the biases and heuristics that influence economic agents in their decision making. Contrary to what was previously believed, we human beings are not completely rational, and as much as we try to be that way, we are always subject to mental traps that influence our daily decisions.

The theory of efficient markets is opposed to behavioral finance, saying that the financial market lives in equilibrium, because all the information on an asset is in the market and all investors have access to this information to make the best decisions in a rational way and that any change in the market would dissipate and the market would return to equilibrium.

It is necessary to clarify in the conclusion of this work, that at no time, the intention was to approach behavioral finance as a better or superior theory in relation to classical finance theory. The real aim was to demonstrate how both can walk in harmony to help financial agents in their decision-making processes.

It is concluded, with this work, that both theories addressed, classical economics and behavioral economics, are in constant transformation and following their process of continuous development, which in general is necessary and extremely positive. However, sensitivity is needed in this evolutionary process, to understand that these currents of thought need to walk side by side so that they can reach a higher level of excellence, creating increasingly complete and assertive models to help economic agents in their decisions and strengthen the market in a systemic way.

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