



**B.Sc. Thesis
in Business**

Behavioral Finance

How psychological factors can influence the stock market

Cindy Alejandra Idárraga Calderón

Advisor: dr. Hersir Sigurgeirsson

Faculty of Business

May 2018



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Thesis towards a BS degree in Business

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Preface

This essay is a 6 ECTS credit thesis towards a B.Sc. degree from the Faculty of Business at the University of Iceland. I want to take this opportunity to thank those that took their time to assist me along this work. Specially, my advisor Dr. Hersir Sigurgeirsson for the great advice and feedback provided throughout my work.

Abstract

The following work aims to research the psychological factors behind decision making amongst investors and the effects these can have in the stock market. The market has long been based on the thought of it being efficient and rational as proposed e.g. by the efficient market hypothesis and the capital asset pricing model. However, the relatively new field of behavioral finance opposes to this theory and sheds light on the importance of researching and understanding the effect psychological factors can have amongst economic agents and their decision making, which influences the stock market.

Great emphasis is given to prospect theory by Amos and Tversky and the propositions of decision making under risk, which is what investors deal with on a daily basis; making decisions under risk given the uncertainty and unpredictability of financial markets.

Herding and overconfidence appear to be those anomalies that investors present the most when making decisions and are straightly linked to market volatility and bubbles. Herding results in trend following behavior amongst investors, leading to overpricing of assets resulting in price bubbles. Overconfidence causes excessive trading without rationally accounting for transactional costs and leads investors to think they have greater capacity to beat the market. Nonetheless, other factors influence decision making as well. Representativeness results in decision making biased by the influence of stereotypes or trends, leading investors to forecast the market based on inaccurate or unreliable data. Availability makes investors more prone to focus on “attention getters” rather than other valuable information amongst the market as well as focusing on information that is clearer and easier to interpret. Anchoring leads investors to focus on reference points when analyzing asset prices. Investors let go of winner too early and retain losers longer due to biased decision making derived from the disposition effect. The extent to which assets are evaluated to have performed well depends on framing effects and personal preferences present amongst investors. Loss aversion and the endowment effect influence bid and ask prices as well as risk aversion amongst investors.

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1 Introduction

Behavioral finance is a relatively new field that has been gathering attention given its input in the investment field. Behavioral finance is a combination of psychology and economics and it attempts to explain investors' behavior and the psychological factors behind their investment decisions and what effects they have on financial markets. The field of finance has long been based on the idea that markets are efficient, and investors are rational with theories such as the efficient market hypothesis and the capital asset pricing model. The efficient market hypothesis entails that the market is unbeatable and economic agents are fully rational, the latter implies that information is fully reflected in market prices. This theory states that a market of this type does not permit arbitrage to take place (Fama, 1970). The Capital Asset Pricing Model describes the relationship between systematic risk and expected return of a security, it entails that investors' expected return is that of the free risk security plus a premium for the systemic risk taken as measured by Beta. It assumes for market equilibrium that emerges from the market and investors' behavior. (Bodie, Kane, & Marcus, 2014).

However, skepticism has arisen since behaviorists have started researching the psychological and cognitive factors behind investment decisions and remark that investors may not be as rational as suggested by conventional theories. In fact, market bubbles are thought to be caused by investors' irrationality; An example of this is the famous dot-com bubble that took place in the late 1990s, which is believed to have emerged from growth speculations amongst the market that was alimented by irrational behavior from investors' behalves (Bodie et al., 2014). These irrationalities emerge from psychological biases, heuristics, and emotional and social factors, thus giving importance to the field of behavioral finance given its potential to become a very valuable complement to classical and neoclassical finance theory which dominate the field.

Investors' decisions influence the stock market. The prices in the market reflect investors' assessment of firms and their value (Bodie et al., 2014, p. 5). Therefore, great emphasis needs to be given to the decision making processes in order to understand how this can affect the stock market. The following work addresses the subject of how psychological factors behind decision making can influence investors, hence, the stock

market, given that the stock market has proven to be very volatile and unpredictable and these anomalies can be attributed, to a great extent, to decision making amongst investors (Malkiel, 2007). Various topics will be addressed starting with conventional theory which emphasizes the thought of human beings being rational and the transition that has occurred on these beliefs since psychologists began to dig further into the mental processes of decision making. Emphasis will be given to the prospect theory proposed by Kahneman and Tversky (1979) and heuristics and biases that have derived from the former.

2 Background and Theory

2.1 Homo Economicus

Homo economicus is a term used in the field of economics and finance for the rational individual as proposed by classical finance theories such as the Efficient market hypothesis. Traditional finance theory sees the “economic man” as an individual who possesses enough precise knowledge regarding those aspects of the environment which are relevant for himself (Deaves, 2010). Simon (1955, p. 1) describes him in the following way: “He is assumed also to have a well-organized and stable system of preferences, and a skill in computation that enables him to calculate, for the alternative courses of action that are available to him, which of these will permit him to reach the highest attainable point on his preference scale”. Homo economicus are thus, those individuals who are said to be rational and make optimal decisions regardless of external factors such as biases (Thaler, 1999).

As stated above, behavioral economics and, more specifically, behavioral finance, have criticized the theories supporting homo economicus. Extensive research has shown that we, as human beings, are not all that rational and consistent as economist have proposed and that it is difficult for us as human beings to remain logically consistent (Kahneman, 2011, pp. 335-336). This research has shed light on the claims that human beings are indeed not “homo economicus” and has given us great insight into the evolving field of behavioral finance by supporting the allegations that there are, without a shadow of a doubt, psychological and cognitive factors behind decision making. Thus, considering that irrationality and inconsistency are part of human nature and therefore present amongst individuals leaves a gap in classical financial theory which is aimed to be filled by the field of behavioral finance.

2.2 Behavioral Finance

Behavioral finance is the field of finance that concentrates on studying psychological aspects that influence decision making amongst humans, more specifically, those of investors and managers (Deaves, 2010). This rapidly growing field emerged as the result of behavioralists and psychologists such as Daniel Kahneman and Amos Tversky and their skepticism about classical financial theories such as the efficient market hypothesis

and the capital asset pricing model, which, as stated above in this work, assume the rationality of those individuals who are in charge of decision making in the market.

Cognitive, behavioral and emotional factors that affect decision making in investors started being more looked upon thanks to the behavioralists named above. The so-called behavioral revolution in the field of finance that took place in the 1980s, began as a result of questions regarding various aspects such as the volatility in financial markets and numerous anomalies present in the market, along with attempts to incorporate to financial theory the prospect theory proposed by Kahneman and Tversky in 1979 (Shiller, 2006). There are various works that bring forward the factors behind investors irrationality and the subsequent consequences that these have in the market. There is evidence that indicates that price fluctuations on assets in the market occur as a result of change in preferences amongst individuals and biases that occur during decision making (Leroy, 2004). However, prospect theory seems to be predominant in the field and it will be discussed further in depth in the following chapter.

2.3 Prospect theory

Irrational behavior seems to be continual rather than sporadic. Prospect theory was developed as an alternative to the utility theory given that the latter does not account for decision making under risk (Deaves, 2010). Prospect theory is a very significant input to the field of behavioral finance. This theory aims to explain the behavior and decision making process of individuals that are faced with risk involving situations that present chances of losses and gains. Prospect theory accounts for three main aspects and extensive experiments have been carried out in order to observe the nature of decision making involving risk.

The first aspect conditions that individuals are not consistent in levels of risk attitude. This aspect emphasizes the fact that individuals do not have consistent risk preferences, rather, they fluctuate between the level of risk they are willing to take, exhibiting a greater tendency for risk aversion when gains were involved and a greater tendency for risk seeking when the prospects were losses, hence, contradicting Bernoulli's expected utility hypothesis that individuals base their decision making on a specific category of

risk preference, which leads to similar preferences amongst prospects of the same nature (Deaves, 2010; Kahneman, 2011).

The second aspect entails that individuals make a relative evaluation to a point of reference when making decisions that involve risk. That is, individuals have a reference point to which they address gains or losses and the sensitivity to losses seems to decrease as this “reference point” increases and vice versa (Deaves, 2010; Kahneman, 2011).

The third aspect suggested by prospect theory involves a phenomenon called loss aversion, which entails that in the majority of cases, losses loom larger than gains (Kahneman & Tversky, 1979). Kahneman and Tversky conducted an experiment in which individuals would gain \$150 if the coin showed heads and would lose \$100 if the coin showed tails. The results of this experiment showed that most people would reject such an offer and that individuals needed a substantial increase on gains in order to accept a risky gamble. The outcomes revealed that a loss was 2.5 times more undesirable than a gain of the same amount of money, which shows that individuals are more affected by a loss than a gain of the same equivalent value (Deaves, 2010; Kahneman, 2011; Malkiel, 2007).

Prospect theory states that the majority of the time, individuals behave to the contrary of the utility theory propositions and it indicates that factors limiting rationality emerge as the result of framing effects and reference points set by individuals when it comes to decision making. Thus, prospect theory indicates that there are various biases that can occur as derivative of these mental processes which will be addressed later in this work. However, prospect theory alone does not seem to account for previous gains and losses and the effect these may have in an investor when cumulated. Hence, cumulative prospect theory was introduced as an alternative, which accounts for those aspects that original prospect theory did not (Forbes, 2009; Kahneman & Tversky, 1992).

2.4 Cumulative prospect theory and asset pricing

An extension of the prospect theory called cumulative prospect theory or simply the “weighting function” can be used in an attempt to explain the role of behavioral finance

in asset pricing. This theory aims to measure risk aversion after a series of events rather than just a one-time gamble as the prospect theory proposes, thus the term cumulative. Another factor that led to the improvement of the former prospect theory was that it did not always satisfy stochastic dominance (Kahneman & Tversky, 1992).

The effect of prior losses and gains on risk taking behavior is analyzed and linked to investors and their decision making. According to Thaler and Johnson (2002), investors acquire a more risk seeking tendency after a loss because they are looking to “break even” for the previous losses and, even though losing again will be very undesirable, the prospect of winning or at least breaking even will provide far more satisfaction when compared to the dissatisfaction caused from a loss, hence, engaging themselves in far riskier investments. In contrast to this, previous losses can also lead to individuals being more reluctant to take upon risk (Thaler & Johnson, 1990).

The processes of integration and segregation can be used to explain this phenomenon. When individuals are faced with unexpected situations or events, they usually base on a reference point to which they integrate or segregate the unexpected situations. Thus, the total perceived value derives from whether integration or segregation are applied (Thaler, 2008). An example that effectively illustrates this shows a person that lost \$150 at a horse track and is presented with the opportunity of betting \$10 with a ratio of 15:1 odds. The extent to which the person decides on taking the risk of betting or not merely depends on aggregation or segregation. If the individual decided to segregate the events, his results would end up on either a break even point or a total loss of \$150. However, if integration takes place, the individual would perceive the final outcome as either a gain of \$150 or a loss of \$10 (Deaves, 2010; Thaler, 2008).

The results from these theories and their research clearly indicate that individuals are affected by a series of heuristics and biases when it comes to decision making. The following text aims to give an insight on the most common types present amongst individuals.

3 Psychological Factors Behind Decision Making

So far, the idea of investors acting like “homo economicus” has been put aside. Investors are being looked up on as normal human beings who have imperfections. The world around us is constantly changing, thus, making the market very dynamic and uncertain. Behavioral finance has remarked the importance of psychology and cognitive factors when it comes to decision making. Decision making on individuals is influenced by a series of factors such as heuristics and biases; cognitive factors do obviously have an effect as well on the performance of each individual and the decisions they make. However, heuristics and biased will be the focal factors along this work.

As mentioned by Deaves (2008), ease of processing is an aspect that seems to influence decision making. When individuals are presented with a wide variety of choices, decision making becomes more complex than when fewer choices are available, either leading to a decision with a negative outcome or to the delay of decision making given that this is perceived as overload for our brain, resulting in an incapability to take immediate action. Given that information processing can be such a complex task as well as basing on the empirical evidence that investors stray from classical financial theory in terms of rationality; Heuristics are used in an attempt to describe and understand these anomalies. Heuristic is defined as “a procedure that helps find adequate, though often imperfect, answers to difficult questions” (Kahneman, 2011, p. 98). The term can be simplified to “shortcut”; a subset of the information set we possess and utilize when it comes to problem solving.

Prospect theory itself can be looked up on when it comes to heuristics given that it specifies a path of actions taken when individuals are faced with decision making that involves risk (Deaves, 2010). Heuristics can be helpful when it comes to decision making, however, they can also lead to biased choices. Heuristics and mental biases have given a tremendous insight into investors’ behavior and decision making process, this has allowed for researchers to understand anomalies that occur in the market. The number of heuristics in literature can be extensive, however, the most remarked ones will be discussed on the following section in order to give greater insight to investor’s decision making and, derivatively, the effect these decisions can have on the stock market.

3.1 Heuristics

3.1.1 Representativeness

As stated by Kahneman and Tversky (1972, p. 33) themselves, “Representativeness biases are present in those who evaluate the probability of an uncertain event, or a sample, by the degree to which it is: i) similar in essential properties to the parent population, and ii) reflects the salient features of the process by which it is generated”.

Extensive research has been carried out in this topic, these studies describe representativeness as the extent to which A resembles B (Kahneman, 2011). The different experiments that have been carried out and the examples used in the majority of textbooks to illustrate this heuristic involve a set of descriptive information, which, corresponds to variable A and a list of occupations to be linked and ranked in order to identify the individual described on variable A as variable B. The outcomes all point to the same conclusion: Respondents base their answers on the representativeness of the individual of the characteristics of variable A rather than adjusting their answers to probabilities. That is, if A is highly representative of B, it must originate from B. Contrary, if A is not representative of B then the probability of A emerging from B is low (Deaves, 2010; Kahneman, 2011).

An important aspect of this heuristics is the so called “base rate neglect”, which, indicates that individuals tend to ignore previously known information and replace it with representative one instead (Deaves, 2010). Conclusions that have emerged from such studies point at the insensitivity participants show to sample size when responding. Misconceptions of chance seem to influence, to a great extent, people’s perceptions of future outcomes. Kahneman (2011) suggests that insensitivity to predictability, influences the predictions of values and demands for securities in the future. He suggests that representativeness is often what steers these predictions due to the phenomena that occurs when descriptions are given on a variable as explained above.

3.1.2 Availability

“Availability is a useful clue for assessing frequency or probability because instances of large classes are usually recalled better and faster than instances of less frequent classes” (Tversky & Kahneman, 1974, p. 1127). This heuristic leads to various biases (Tversky & Kahneman, 1974). Availability presents a higher likelihood of taking place with events that have recently occurred and are salient; entailing that those events that are easily recalled are believed of having a greater probability of occurring (Deaves, 2010).

A very famous example given in literature about availability entails asking individuals whether they believe more words begin with a k or have a k in the third position. The results show that it seems to be easier to think of the letter by which words begins instead of thinking of their third letter, thus, respondents attribute more probability to the option of words beginning with k rather than including it on the third position even though this is not so in reality (Deaves, 2010; Tversky & Kahneman, 1974).

Barber and Odean (2008) proposed and tested a hypothesis which aimed to discover whether the information available could influence investor’s behavior. There is a vast amount of information in our environment, leading attention to become a scarce resource. Consequently, an individual exposed to various alternatives will most likely consider those that attract more attention. The researchers argue that those “attention getter” factors are presence of the stocks in the news, high abnormal trading volume and extreme one-day returns. They propose that the conclusion of the study implies that the results are concrete enough to confidentially state that the information availability influences individual investors’ behavior when it comes to the purchase of stocks.

Another aspect discussed by Barber and Odean (2008) is that selling is a different process given that individual investors in their majority, hold a small portfolio set and this facilitates the process due to fewer alternatives in the decision making set. Humans beings are prone and predisposed to lean towards easier alternatives, therefore, information that allows for quick and clear interpretation is easier to retain when compared to information that requires processing and interpretation (Tversky & Kahneman, 1974).

3.1.3 Anchoring

Another common addressed heuristic in behavioral finance literature is anchoring. This phenomenon occurs when individuals use a starting point on from which they deduct a final estimate. The starting point comes from the formulation of the problem or as a result of partial computation (Tversky & Kahneman, 1974; Deaves, 2010). Several experiments have been carried out regarding this phenomenon and the results have supported the theories that anchoring is indeed a type of heuristic present amongst individuals when it comes to decision making.

An experiment worth citing was carried out by Tversky and Kahneman (2011) in which they recruited a group of students from the university of Oregon and asked them to spin a wheel of fortune, which had been fixed to stop on the numbers 10 and 65. The participants were asked to spin the wheel and then answer the following questions: “Is the percentage of African nations among UN members larger or smaller than the number you just wrote?” and “What is your best guess of the percentage of African nations in the UN?” (Kahneman, 2011, p. 119). One would think that an arbitrary number obtained by spinning the wheel would not influence the answers given by the participants. The results obtained showed that participants did indeed take the numbers given by the wheel as a reference point for their answers. Those participants that obtained number 10 as an anchor gave an estimate of 25% as an answer, and those who obtained number 65 estimated 45% as their answer.

Anchoring is believed to present itself as the result of two different mechanisms: Anchoring as a process of adjustment and anchoring as a priming effect. The former entails that individuals estimate unknown quantities that serve as anchors by basing it on known information and gradually adjusting it by moving from the anchor based on their beliefs of the anchor’s accuracy. Anchoring as a priming effect suggests that anchoring develops as a result of priming, that is, as a consequence of suggestion that aims to alter decision making (Kahneman, 2011).

Investors present anchoring subject to reference points, which are security prices to which they compare possible purchases. It is believed that investors, in the majority of time, wait for securities’ prices to reach a certain reference point in order to trade (Baker & Nofsinger, 2002).

3.1.4 Herding

The phenomenon that occurs when individuals are influenced by others' perceptions when it comes to decision making is called herding (Deaves, 2010; Forbes, 2009; Malkiel, 2007), or more accurately, "herding is a group of investors trading in the same direction over a period of time" (Nofsinger & Sias, 1999, p. 1). Various models and experiments carried out have shown that herding can indeed influence investors' behavior when it comes to decision making (Forbes, 2009; Malkiel, 2007).

Large swings in market prices have been attributed to this phenomenon (Deaves, 2010). In fact, bubbles are thought to be caused to an extent by herding mentality. Examples include bubbles such as the tulip bulb that took place in 1636 and the internet bubble that occurred at the end of 1990 (Forbes, 2009).

A study carried out by Nofsinger and Sias (1999) examines herding behavior on both individual and institutional investors; the results indicate that individual investors present a herding conduct as a result of following trends, similar markets signals to other investors or as a result of overreaction to the market. Positive feedback trading is also considered to be a factor that can induce investors to herd (Patel, Zeckhauser, & Hendricks, 1991; Sirri & Tufano, 1998).

As stated above, alteration of prices in the stock market is attributed to herding and, more accurately, institutional investors' herding. Nonetheless, this is not necessarily a negative aspect given that institutional investors may have access to better information than individual investors, thus, herding will induce the purchase of undervalued shares rather than overvalued, therefore pushing stock prices towards the equilibrium value (Nofsinger & Sias, 1999).

3.2 Biases

The biases that identify and explain the decision making of economic agents are various thanks to the input of many researchers, mainly, Kahneman and Tversky. These biases are connected to gains and losses and can be closely linked to prospect theory. Regardless of the vast amount of biases present amongst economic agents, certain ones have been accounted for more than others when it comes to decision making. The biases that will be explained below are in accordance with and derived from prospect theory.

3.2.1 Overconfidence

The most discussed bias in research in the field is overconfidence. Deaves (2010), describes it as the tendency to overestimate one's knowledge, abilities and the precision of the information one has. Several researchers have investigated this phenomenon and its effect on the stock market, particularly, excessive trading.

As stated by Deaves (2010), there is substantial evidence that overconfidence of investors leads to excessive trading. This statement is also supported by Thaler, who suggests that excessive trading due to overconfidence is very plausible. Investors who show traits of being overconfident deduct that they are smarter than other traders, leading to a cycle of excessive trading given that overconfidence seems to be a bias that persists amongst investors (Thaler, 2017). Excessive trading is due to investors overconfidence on beating the market, past wins may give them a sense of assurance and aliment this overconfidence (Malkiel, 2007; Odean, 1998). Odean (1998) suggests that overconfident traders do not rationally think of transaction costs when comparing them to the profit to be made from the trade itself. In a vast majority of cases, the securities they buy will outperform those they sell, however, when taking transaction costs into account, the trade itself was not profitable and investors would have been better off by skipping trading the securities (Odean, 1999).

3.2.2 Disposition Effect

The Disposition Effect has been addressed by various researchers (Odean, 1998; Shefrin & Statman, 1985). This phenomenon leads investors to sell "winners" too early and retain "losers" too long. There is enough empirical evidence that shows that investors let go of superior performing stock and hold poorly performing stocks as a result of certainty effect; after having gained a certain amount of money, investors become more risk averse. On the other hand, risk seeking (holding onto losers) is applied after having experienced a loss (Deaves, 2010).

Another aspect regarding the disposition effect is that investors seem to adapt a behavior in which "buying is forward looking and selling backward looking". (Barber & Odean, 2011, p. 36). Investors focus on what a certain stock has done for them for a certain period of time and then decide on whether to sell it or not; If the stock has given them good returns they tend to believe that it has come time for that stock to be sold

and profit from the sale. On the contrary if a stock has not performed very well in the past, investors are inclined to think that holding it for a longer period will allow for that stock to perform well (Barber & Odean, 2011).

3.2.3 Loss aversion, endowment effect and status quo

Loss aversion goes hand in hand with both the endowment effect and status quo; in fact, the two latter emerge as an implication of the former. As stated earlier on this work, loss aversion occurs when individuals are more affected by losses than gains of the same utility (Kahneman & Tversky, 1979). Endowment effect occurs when individuals demand more money to give up an object than they would be willing to pay to acquire this good themselves (Kahneman, Knetsch & Thaler, 1991, p.193). Individuals give more value to things that are already part of their belongings than things that could be acquired and be owned (Thaler, 2015).

Literature regarding this phenomenon suggests that the reason why this occurs is linked to opportunity cost, that is, the dissatisfaction experienced when having to give something up is more strongly felt than the satisfaction one would experience when acquiring an object (Kahneman et al., 1991). This can be straightly correlated to loss aversion, one of the main propositions of prospect theory. Investors seem to be affected by this phenomenon in the sense that the value given to an owned stock is higher than the value other investors would give to the same stock, thus, affecting bid and ask prices as well as liquidity within the market.

The endowment effect also seems to affect more individual investors rather than institutional, research even posits that the ability to minimize the presence of this bias can be learned through experience, explaining why it presents itself more on individual investors (Kahneman et al., 1991).

Status quo bias occurs as a result of loss aversion, individuals prefer to remain in their status quo given that the advantages that could be acquired weigh less to an individual when compared to the disadvantages that could follow. This remains constant with prospect theory (Kahneman, et al. 1991; Samuelson & Zeckhauser, 1988). Empirical evidence shows that decision makers do indeed display a significant status quo bias (Samuelson & Zeckhauser, 1988).

3.2.4 Myopic loss aversion

Yet another bias that seems to affect investors is myopic loss aversion. This phenomenon involves one of the main aspects of prospect theory which is greater sensitivity for losses along with a new factor which is the frequency of portfolio evaluation. Myopic investors are defined as those who are short-term focused and review their gains and losses at a frequent rate. Given that loss aversion causes for the dissatisfaction for a loss to be greater when compared to the satisfaction of a gain, investors differ on the stock they invest on based on time horizons and their performance within this time. An effect that can be attributed to an extent to myopic behavior amongst investors. Myopic loss aversion derives from one of prospect theory's principles, loss aversion, and yet one other bias which is mental accounting (Thaler, Tversky, Kahneman, & Schwartz, 1997).

3.2.5 Mental accounting, sunk cost fallacy and house money effect

The process of mental accounting, as defined by Thaler (2007), is "the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities" (Thaler, 1999, p. 1). Individuals often create silos in their minds in order to allocate their money into different mental accounts. Prospect theory allows for a greater understanding of the processes of mental accounting, where the aspects of point-reference, framing, integration and segregation play a critical role. The extent to which investors segregate or integrate their stocks, has an effect on the level of satisfaction they experience.

A study that was carried based on prospect theory, suggests two terms deriving from mental accounting: "portfolio accounting" and "stock-level accounting". The former indicates that investors experience satisfaction or dissatisfaction based on the overall performance of their portfolio (integration) and that losses, as prospect theory indicates, loom larger than gains. On the other hand, "stock-level accounting" leads investors to feel pain or pleasure based on the performance of individual stocks (segregation), however, losses remain causing more dissatisfaction than gains (Barberis & Huang, 2001).

Another aspect that derives from mental accounting is the "sunk cost fallacy". Individuals seem to experience difficulties letting go of something where money has

been invested, even if the outcome seems to be detrimental, this occurs as a result of individuals taking into consideration sunk costs when making a decision about future investments (Thaler R. H., 2015). Expectations seem to play a large role in decision making as well. Whether an event is to be considered a gain or loss merely depends on the expectations held by the individual.

Thaler (2017) also discusses something he calls the house money effect, which describes how individuals' process of decision making can be influenced by previous gains or losses. Thaler presents this in the form of a gambling game; He states that a gambler that has just won \$30 is less reluctant to risk when using the newly acquired money than when using the money he owned prior to winning because they see this money as the "casino money" and not their own or previously owned money (Thaler, 2017) (Thaler & Johnson, 1990). When looking at this proposition, a clear connection can be made in between the gambler and investors. Investors that have made profit on their investments may be more inclined to making risky investments with those returns for the simple assumption that they would only be losing "new money". This is consistent with cumulative prospect theory propositions; When weighted, prior experiences have an impact on decision making (Kahneman & Tversky, 1992).

4 Conclusion

Based on all the research carried out, it can be concluded that there are various psychological factors behind investors' decision making. Economic agents are no longer categorized as homo economicus or rational individuals that can process the vast amount of information around them and make optimal decisions as suggested by effective market hypothesis. Heuristics and biases that emerge as a result of mental processing involving risk, lead individuals to make biased decisions that can, in many instances, be wrong. This is due to our limited capacity to account for every single factor and their possible outcomes in the process of decision making.

The efficient market hypothesis accounts for markets being efficient and economic agents being fully rational (homo economicus). In this type of market, there are no arbitrage opportunities, information is fully reflected in market prices and investors are fully rational, capable of accounting for every single outcome possible and making optimal decisions based on the information possessed. Behavioral finance, on the other hand, opposes this rationality and focuses on the psychological factors amongst economic agents when it comes to decision making, which lead to biased and irrational decisions. Thus, shedding light on the inefficiency of the market due to volatility and anomalies that derive from these psychological factors.

There are numerous heuristics and biases that can affect economic agents. Based on the research conducted, however, there are two factors that seem to have greater weight when it comes to decision making amongst investors: Herding and overconfidence. Herding is believed to have an influence in market bubbles and volatility. Investors follow trends and follow the herd rather than questioning others' behavior even when anomalies seem to be present amongst the market. This has been shown to occur more amongst individual investors than institutional given that individual investors often have the belief of institutional investors having access to better information and, therefore, having advantage in the market. Overconfidence presents itself as the belief of having greater abilities and capacity when compared to others. The effect of this bias amongst investors leads them to excessive trading, not accounting for the transactional costs incurred as well as acquiring and disposing of stocks at times that are not optimal.

Apart from these two main factors, there are many other that influence investors' behavior and their abilities of decision making. Information availability leads to investors being more prone to focus on the pieces of information that first come to mind when thinking of a certain aspect. Anchoring leads investors using certain reference points, from which the decisions made will be derived from. Mental accounting influences investors' preferences, which affect the way in which performance is measured; Leading to decisions being based on the personal beliefs of investors and not merely on rationality.

To conclude, financial markets show volatility and irrationality. This opposes the efficient market hypothesis, allowing for the conclusion of markets being influenced by psychological factors that allow for these anomalies to occur. That is, investors are no longer believed to be homo economicus but rather human beings with limited capacity and influenced by psychological aspects, hence, assuming that psychological factors can indeed influence the stock market through the presence of heuristics and biases amongst investors and their decision making.

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