



COGNITIVE BIASES AS AN INTEGRAL PART OF BEHAVIORAL FINANCE

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Abstract: The complex world of finance is characterised by numerous irrationalities that representatives of behavioral finance seek to explain by cognitive biases (flaws, inclinations or anomalies). Cognitive biases represent imperfect perception of reality and are caused by limited cognitive capacities of decision-makers. By analysing cognitive biases, the paper aims to answer the following questions that standard finance fails: Why active portfolio strategy is still the most influential strategy in portfolio management despite the mounting evidence of unsuitability of its application? Why investors prefer dividend payout over increase in capital value (dividend puzzle)? Why investors ignore benefits of investment diversification and choose to invest in a small number of shares of well-known local businesses (diversification puzzle)? Why investors avoid to sell “loser” shares and thus reduce the tax burden? Why shares of small companies usually bring higher returns compared to shares of large companies? The answers to these questions are obtained by using qualitative research methodology, which also represents the main result of the research.

Keywords: cognitive biases, behavioral finance, financial decision making

JEL classification: G40, G41

1. Introduction

With the development of standard finance and widespread application of complex econometric models, economy has started to move away from the field of social sciences and gravitate towards the field of natural sciences. The emergence of behavioral finance prevented further distancing of economy from the social sciences

by integrating specific scientific knowledge in the fields of psychology, sociology, anthropology and economics, and shifting the main focus to people, i.e. the human factor.

Behavioral finance shifts the focus of economic theorists and researchers from the complex mathematical and statistical models to studying human behavior and psychology. The focus of behavioral finance is the analysis of the process of making financial decisions, with representatives of behavioral finance pointing to the frequent disruptions of the principle of the rational financial decision-making. In addition to the disruption of the mentioned principle, another even more significant issue emerges and that is the issue of systemic recurrence of irrationality.

Irrationalities that occur in the complex world of finance are explained by behavioral economists based on the cognitive biases which emerge due to limited cognitive capacities of decision makers. Systemic errors in reasoning and irrational outcomes of the decision-making process are, in fact, the results of cognitive biases.

Based on the above stated facts, the subject of the research presented in this paper refers to cognitive biases as an integral element of behavioral finance and source of irrational reasoning in financial decision making. The aim of the research is to seek answers to many of the questions that are puzzling standard finance in order to fill in the gaps in the standard financial theory and provide a better understanding of the causes of “irrationalities” in financial decision making. Understanding cognitive biases, especially the ways and mechanisms of overcoming them (Nikolić, 2018; Otuteye & Siddiquee, 2015) can be of great benefit to investors, portfolio managers, financial analysts and other financial decision makers.

In accordance with the defined subject and aim of the research, the initial hypothesis assumes that cognitive biases hold the answer to many puzzling questions that traditional economists failed to answer.

Qualitative methods of economic analysis are used in this paper to study the current scientific literature in the relevant field, and thus find the facts which confirm the initial hypothesis, as well as to formulate accurate conclusions.

Based on its defined subject, aim and hypothesis, the paper, after the introductory section, provides information on formulation and development of the concept of behavioral finance, as well as describes the key features of this relatively young field of finance. It continues with the analysis of thirteen cognitive biases in order to explain the occurrence of irrationalities in financial decision-making. Special attention is given to elaboration of the examples of analysed cognitive biases in order to provide a more complete picture of their effect on the decision-making process. Finally, the concluding section of the paper sums up conclusions on the confirmation of the initial hypotheses, points to the limitations of present research, as well as provides suggestions for future research.

2. Theoretical formulations, development and key features of behavioral finance

Behavioral finance is relatively young and productive field of finance, which is rapidly developing and finding its place in practice. According to De Bondt et al. (2010), behavioral finance rests upon the following:

- Cognitive (behavioral) psychology – which studies cognition, i.e. mental processes that regulate human behavior. It focuses on the mental process, that is, examines how minds of investors undertake the calculations required to maximise wealth;
- Emotional aspects – which tells us that decision-making process is more than a strictly calculative process;
- Social psychology – which recognises the need of a decision maker to be accepted in society and to find encouragement for his/her decisions.

In terms of qualitative methodology, behavioral finance mainly uses inductive approach. By employing experimental research, the way in which some person behaves, thinks and makes financial decisions is observed. This is followed by drawing general conclusions by applying generalization.

Studies in the field of behavioral finance have contributed to a significant improvement of financial theory and investment practice. Psychologists Paul Slovic, Daniel Kahneman and Amos Tversky, and economists Meir Statman, Hersh Shefrin, Werner F. M. De Bondt, Richard H. Thaler and Robert Shiller are among the most deserving scientists in terms of development of behavioral finance.

The publication of Slovic's study "*Psychological Study of Human Judgment: Implications for Investment Decision Making*" in the journal "*The Journal of Finance*" in September 1972 (Slovic, 1972) marked the birth of behavioral finance. However, a scientific paper by Kahneman and Tversky entitled "*Prospect Theory: An Analysis of Decision under Risk*", published in the journal "*Econometrica*" in March 1979 (Kahneman & Tversky, 1979) resonated much stronger in terms of the investing public. Given their critical role in the development of behavioral finance, Daniel Kahneman and Amos Tversky are rightly considered the founders of this new school of economic thought.

Shefrin and Statman authored the first paper in the field of behavioral finance entitled "*Explaining Investor Preference for Cash Dividends*", which was published in the "*Journal of Financial Economics*" (Shefrin & Statman, 1984) in 1984. However, some authors are of the opinion that the behavioral economics emerged much earlier. According to Shefrin (2015), John Maynard Keynes wrote about the role of psychology in the economy back in 1930s. Terms "optimism", "self-esteem" and "sentiment" are used in many places throughout his famous work "*The General*

Theory of Employment, Interest and Money”, as well as the word “psychology”. Hence, for Shefrin, Keynes is undoubtedly a behavioral economist.

Since 2002, the year in which professor Daniel Kahneman was awarded the Nobel Prize in economics, this scientific field has been rapidly developing. According to Curtis (2004, p. 16), there is nothing like the Nobel Prize to attract investing public’s attention.

Regardless of the time of the occurrence, theoretical learnings and results of empirical research in the field of behavioral finance greatly challenge standard finance paradigm. Proponents of behavioral finance claim that standard finance implies the application of too restrictive assumptions and rules of exact science which fail to explain complex financial reality. Therefore, behavioral finance, by incorporating psychological elements, seeks to fill in the gaps and improve standard finance theory.

Psychological elements have an important role in the process of making investment decisions. Understanding these elements, their role and importance, contributes to the improvement of investment decision-making process (Ljubojević & Dašić, 2018; Vučković, 2010). Individual investors who understand behavioral finance will understand their own behavior, avoid the psychological pitfalls and improve their investment decisions, while institutional investors, thanks to their knowledge in this field, will be better at serving and educating their clients (Statman, 1995, p. 21).

Behavioral finance bridges the gap between standard finance and financial reality. It better informs investors, portfolio managers, financial professionals and other market participants on how financial decisions are made. According to Bikas et al. (2013), the key difference between the standard and behavioral finance is reflected in the fact that standard finance does not deal with the question “why” investors make one decision or another.

Furthermore, in contrast with standard finance which builds on the concept of *perfect rationality*, behavioral finance is based on a much more realistic concept of *bounded rationality* introduced in economics by Nobel laureate Herbert A. Simon (1955). In other words, while standard finance assumes a perfectly rational investor or *homo economicus* who is well informed and has perfect knowledge, behavioral finance assumes a normal investor, i.e. the common man (*homo sapiens*), who is not perfectly informed, does not possess perfect knowledge and is not guided by purely economic motives.

Normal investors are ordinary people who make systematic errors in decision-making process. Their abilities to multitask are limited, as well as their capacity to process information. Also, their ability to solve complex problems is modest (Todorović, 2011, p. 277). Normal investors are characterised by cognitive imperfections that ultimately result in irrationality in financial decision-making.

In real life situations, decisions are often made based on subjective assessments, preferences and biases that do not reflect real world facts. Answers often depend on how the questions are framed, decision makers are often guided by their wishes, hopes and fears instead of facts and they use mental accounting, hence ignoring the fact that the various asset baskets are all interrelated (Curtis, 2004). Due to information asymmetry and limited cognitive capacity of decision makers, errors occur in their behavior that negatively affect the outcome of the decision-making process (Nikolić, 2018).

3. Cognitive biases as a rationale behind irrationality in financial decision making

Behavioral finance seeks to explain the reasons behind the irrational behavior of investors and find answers to many questions that remain unanswered by standard finance, such as: Why the active portfolio strategy is predominantly applied when managing a portfolio despite a growing number of studies that indicate this strategy is unsupported by results? Why investors would rather have a one-dollar of dividends than a one-dollar increase in the value of capital? Why investors ignore the benefits of diversifying investments and invest in only three or four securities? Why they ignore investment diversification benefits and rather invest in only three or four securities? Why they hang on to “losers” and thus increase the tax burden and why small-cap shares bring higher returns than large-cap shares.

In order to answer these and similar questions we should consider cognitive biases, however we must keep in mind that a single behavioral finance model cannot be universal tool for answering all the questions. According to De Bondt et al. (2010), just as in medicine there is not one drug for every disease, so we should not expect that there will be one model that will fit all of the behavioral finance aspects.

The literature on behavioral finance particularly looks at the following behavioral biases:

1) Overconfidence bias – People overestimate their knowledge and abilities, and are over-optimistic (Baker & Ricciardi, 2014; Broihanne et al., 2014; Lichtenstein et al., 1982; Odean, 1998). Overconfidence and overoptimism are two similar phenomena; however, “optimism relates to an overestimation of the mean value, while overconfidence refers to underestimation of the standard deviation of an outcome” (Todorović, 2011, p. 283). Excessive or unrealistic optimism occurs when individuals unrealistically and too optimistically predict future events, without analysing all relevant information (Nikolić, 2018, p. 54).

People often overestimate the likelihood of desired events and underestimate the likelihood of adverse events, i.e., underestimate risk. For example, participants in the games of chance often overestimate the probability of winning, but underestimate the probability of loss. Active portfolio managers overestimate their ability to beat

the market. According to De Bondt and Thaler (1995), when people say that they are 90% sure that some statement is true, they may only be correct in 70% of the cases. Also, nearly all people consider themselves above average in their ability to get along with others.

Behavioral theorists explain the persistent application of active portfolio strategy, regardless of mounting evidence challenging its reliability, by overconfidence of portfolio managers. According to De Bondt and Thaler (1995), overconfidence explains why portfolio managers trade so much and so frequently, why investment and pension funds hire active portfolio managers, and why even financial economists often hold actively managed portfolios – this is because they are all confident that they can pick winners and beat the market. Therefore, behavioral theorists use overconfidence of portfolio managers to explain their often unfounded belief in their ability to achieve better results and overperform the market.

Furthermore, overconfidence is the answer to the question of why many investors ignore the benefits of investment diversification. Nowadays, the optimal number of stocks in a portfolio has grown to over one hundred (Domian et al., 2007); however, individual investors still hold only three or four stocks. The low level of diversification of investments occurs due to the underestimation of risks caused by overconfidence and preferred equity investments in local companies for which the majority of investors work for. Based on the foregoing, it is concluded that active portfolio management, excessive trading and low level of diversification of investments are the basic indicators of overconfidence.

Among the factors that support overconfidence, the following stand out: *illusion of knowledge* and *illusion of control bias* (Baker & Nofsinger, 2002). The illusion of knowledge is the false belief that larger volume of information necessarily means a higher level of knowledge. Correctly interpreting the information is much more important than the information volume, however many individuals do not have the required ability, skill and experience to do so.

On the other hand, the illusion of control bias is an illusion that people have some control over some event and its outcome, although this is not the case (Langer, 1975). For example, a family member who holds a TV remote controller in his/her hand believes that he/she will be more successful than other family members in finding a quality television programme, although the programme is predetermined. Similarly, the student achieves the illusory control over the result of the exam test if he/she randomly chooses a question card, rather than answer a predetermined question. Therefore, the illusion of control bias in investing involves illusory control over the outcome of investing and usually results in excessive trading and insufficient diversification of investments.

It is interesting to note that many psychological studies that examined the relationship between gender and cognitive bias, showed a significantly higher degree of overconfidence among men than among women. In a famous study conducted by

Barber and Odean (2001) it was found that in the period between January 1991 and February 1997, men traded on average 45% more frequently than women, and a higher volume of trade, as demonstrated by Glaser and Weber (2007), is an indicator of a higher degree of confidence. In addition, the wealthier and more powerful investors are much more confident. The growth of wealth and power intensify overconfidence (Fast et al., 2012), but the growth of overconfidence due to excessive trading often lowers the investor's wealth.

Finally, it should be noted that overconfident investors tend to have overexpectations, therefore, they are often dissatisfied with the achieved results and are trying to justify them with many excuses, unexpected events and unforeseen circumstances. People tend to attribute successes to personal knowledge and skills (*self-attribution bias*), and blame others for their failures or simply attribute them to circumstances and bad luck. For example, most students attribute good results in the exam to personal knowledge, while poor results are often attributed to high and rigorous evaluation criteria (Pompian, 2006).

2) Framing bias or framing – The manner of formulating, framing and presenting a problem or a situation affects the ultimate outcome or final decision of an individual (De Martino et al., 2006; Liu & Chiu, 2015; Tversky & Kahneman, 1981). It is more likely that an individual will buy two pieces of the same product marked “two for the price of one” than the same two items at 50 percent off. Similarly, it is more likely that an individual will buy three products marked “three for the price of 300 RSD”, than three items for 100 RSD each. Also, many customers will think the product much cheaper if the price is marked 2,999 RSD instead of 3,000 RSD.

According to Kapor (2014), framing is a combination of attitudes, values and mental models that individuals use to evaluate and understand some situation. People look through these decision-making “frames” the same way as they look through spectacle frames. A positive frame means emphasising the positive aspects of possible outcomes, while a negative frame means emphasising the negative aspects of the possible outcome. If a decision, problem or situation are positively framed in a “winner's frame” people will show the well-known risk-aversion, while in the case that the same decision, problem or situation is negatively framed in a “loser's frame” they will show risk-seeking tendencies (Todorović, 2011). If a doctor communicates to a life endangered patient that he/she is 50% likely to be cured if he/she agrees to the still insufficiently tested treatment, the patient probably will not be ready to take risks, because the information is framed in the “winner's frame”. On the other hand, if a doctor communicates to a life endangered patient that there is 50% chance that he/she will not survive if he/she does not agree to an untested treatment, the patient will most likely be ready to take risks, because the information is framed in the “loser's frame”.

On the other hand, contrary to the proponents of behavioral finance who point to the important role of framing in financial decision making (*frame dependence*), representatives of standard finance point out that participants in the financial market make decisions based solely on the objective observation of the relationship between return and risk, therefore framing has no effect on making financial decisions (*frame independence*).

3) Heuristics – Mental shortcuts, i.e. *rules of thumb*, are employed in order to find a satisfactory solution to the problem in a short period of time (Baker & Nofsinger, 2002; Benartzi & Thaler, 2007; Hammond et al., 1998). Heuristics are defined as simplified strategies of solving complex issues and problems (Caputo, 2014).

Main advantages of using heuristics as intuitive and empirical methods are saving time, energy and financial resources. Heuristics, as simplified mental strategies, can significantly reduce the complexity of the decision-making process. When faced with N alternatives to invest money, many investors use the 1/N rule: if three investment funds are available, the easiest thing to do is to invest 1/3 of funds in each of them (Ritter, 2003). Similarly, when making financial decisions, investors often apply heuristics that past performance is the best indicator of future performance, which is precisely why they invest in past “winners”.

However, the implementation of these and similar mental shortcuts often results in wrong financial decisions and systematic errors. By using mental shortcuts investors make premature decisions that are not based on the systematization of all the information available (Baker & Nofsinger, 2002).

4) Mental accounting bias – Individuals organise, categorise and evaluate financial activities by linking them to separate mental accounts (Henderson & Peterson, 1992; Liu & Chiu, 2015; Thaler, 1999). Many families have household budget for food and household budget for entertainment. Dinner at home is financed from the budget for food, while dinner in the restaurant is financed from the budget for entertainment. When choosing between lobster and fish, the family will opt for fish for dinner at home because it is cheaper. However, when eating at the restaurant, that same family will order lobster despite the high price. If the family instead ate lobster at home, and fish in a restaurant, they could save a large sum of money, therefore the described behavior is considered irrational. The obvious cause of irrational behavior of the family is mental accounting, i.e. the separation of food account and entertainment account (Ritter, 2003).

Moreover, many households put away money in a rainy-day budget and are not willing to spend money from this budget, even the small sums, in case of any unplanned expenses. They rather cover these expenses by borrowing money, although this includes paying interest. It is irrational and illogical to have the money and borrow it at the same time.

The mental accounting is largely the answer to the question mentioned above of why investors prefer dividend payment over capital gain - in Statman's (2017, p. 136) words, why investors worry about whether their money is in the left pocket for dividends or in the right pocket for the capital if both sums are exactly the same. Investors prefer one dollar of dividends over one dollar increase in the value of capital, because these two dollars are in separate mental accounts. The dollar of dividends paid is in the "spending account", while the dollar for capital is in the "savings account". Not earning dividends means reduced spending and reduced satisfaction of shareholders, as well as consumers. Despite the objections due to reduced spending, shareholders are usually not willing to sell their shares and achieve a capital gain. By selling shares, a kind of "homemade dividends" would be earned, however, there is a risk of regretting of doing so if the price of the shares sold increases in the future.

In addition, the payment of dividends supports the feeling of self-control, because shareholders are spending the money in the amount of dividends paid. On the other hand, the realization of capital gains may result in the lack of self-control and excessive consumption, since a significantly larger amount of money is available for spending.

5) Representativeness bias, i.e. availability bias or recall bias – implies making financial decisions based on the available and easily accessible information that is not necessarily complete and representative (Baker & Ricciardi, 2014; De Bondt et al., 2008; Hammond et al., 1998; Hayibor & Wasieleski, 2009; Tversky & Kahneman, 1974). According to Ritter (2003), people put too much weight on recent experience or the experience that immediately comes to mind. Also, people put too much weight on information spewed out by media on everyday basis. Swimmers often underestimate the danger of currents and overestimate the danger of shark attacks, because media covers almost every shark attack story and rarely reports on the occurrence of the dangerous water currents (Shefrin, 2010). Similarly, people often overestimate the danger of traveling by plane, despite the fact that flying is actually one of the safest forms of transportation, and underestimate the dangers of road transportation, because the media around the world are apt cover any plane crash as breaking news, while road accidents get much less media coverage.

Furthermore, investors, guided by the representativeness bias, overestimate the likelihood that the purchase of well-known large cap stocks is a good investment decision. The groundedness of such investment decisions is questionable, because the high demand for the shares of large companies implies a high share price and consequently low returns. Also, when choosing securities, investors are often guided by recent movements in their prices, completely ignoring their fundamental value. They believe that the securities that used to generate above-average returns in the past will continue to do so in the future, thereby ignoring the possibility of a well-known regression towards the mean, or average value. Similarly, when choosing an investment fund to entrust the management of their assets, investors usually opt for

the investment fund that has recently managed to “beat” the market, or the one most aggressively advertised, i.e. the one most present in the media.

According to Pompian (2006), investors usually realise those investments that match their experience, such as investments within the industry in which they are employed or the investments within the region where they live. Investors who work in the tourism sector invest in tourism companies and hotel facilities (Kostić et al., 2019). In addition, investors choose those investments that match their personality traits and preferences. Thrifty individuals will not invest money in expensive shares, thus missing out on the benefits that come with owning these shares; instead, they opt to invest their money in cheaper shares. On the other hand, collectors of antiques, guided by their preferences, are willing to fork out large sums of money to come into the possession of the piece that will complete the collection.

Thus, representativeness bias implies that investors make unfounded financial decisions and jump to conclusions based on a limited set of information, advertising ads, recommendations from friends, some isolated case, analogies, stereotypes or events that have left a strong impression, i.e., a strong emotional impact, on them. Representativeness bias means that investors make conclusions without taking much thought of the size and representativeness of the sample. They ignore the fact that small samples are not equally representative as the large ones. The *law of small numbers* cannot replace the law of large numbers, therefore related misconceptions often result in making wrong decisions.

6) Conservatism bias, i.e. status quo bias or anchoring bias – implies resistance to change and attributing undue emphasis to long-term trends (Dean et al., 2017; Epley & Gilovich, 2006; Riella & Teper, 2014; Samuelson & Zeckhauser, 1988). People get used (“anchor”) to the existing state of affairs and resist changes, i.e. it takes a long time for people to accept them, because every change carries some risk and an air of discomfort. Those people who inherited some company’s shares, let say from their father, that had been held by his/her family for many years, will find it very difficult to sell them, even if the price of these shares is continuously declining and most investors are trying to sell them.

The fact that people are reluctant to change is indirectly supported by research conducted by Johnson and Goldstein (2003). In some European countries (e.g. in Austria, Belgium, France) over 95% of the citizens are willing to donate an organ, while in other European countries (e.g., Denmark) the willingness to donate an organ is below 10%. The reason lies in the fact that, in the first group of countries, based on the relevant applicable law, all citizens are considered to have agreed to be an organ donor when they die unless they have recorded or explicitly expressed in words a decision not to donate, while in the second group of countries citizens are not considered donors by default and they have to register in order to become organ donors. It is not difficult to conclude that in both groups of countries only a small percentage of the citizens will decide to change the default option, i.e., the existing

state of affairs, which confirms the assumption that people are not prone to changes – more precisely, they avoid them.

An integral part of the tendency to avoid changes is the *endowment effect* which implies overestimation of the true value of one's real or financial assets (Morewedge & Giblin, 2015). People get sentimentally attached to assets they own, which is why they are not willing to sell them at fair market or any other price. Many people are reluctant to sell their car at twice the price of its real market value. In the case of inherited family home, the endowment effect is even more pronounced.

When changes do occur, people underreact because of conservatism. However, if there is a long enough pattern of such changes, the people will adjust to it and in most cases overreact (Ritter, 2003). Therefore, in a short-term period, conservatism cause people to underreact; however, it will cause people to overreact to changes in a long-term period.

The above explained cognitive bias is also in literature referred to as “anchoring” or “anchoring effect” (Caputo, 2014; Costa et al., 2018). “Anchoring” is a phenomenon where people often rely too heavily (“anchor”) on some trait or a piece of information they receive when they are making decisions and are reluctant to stand corrected, even if new information definitely indicates that this piece of information or trait is incorrect (Kapor, 2014, p. 82). Conservatism and the “anchoring” imply turning a deaf ear to new information and often result in misjudgments. If you ask an average citizen of the Republic of Serbia whether the gross domestic product (GDP) of the Republic of Serbia is above or below 20 billion euros, he/she will pick one of the two provided answers. And if you go on to ask the same individual to estimate the absolute amount of GDP, he/she will likely estimate it to about 20 billion euros due to anchoring caused by the first question¹.

7) Loss aversion bias – Refers to the fact that people treat gains and losses differently in terms of giving greater importance to potential losses (Baker & Ricciardi, 2014; Benartzi & Thaler, 1995; Camerer, 2005; Pope & Schweitzer, 2011). Although, as a rule, investors seek to maximize their gains, they still find it more important to avoid potential losses. A number of research studies, such as the one conducted by Tversky and Kahneman (1992), show that discontent generated by losses is 2 – 2.5 times greater than the satisfaction achieved due to equal percentage of gains. For example, a loss of 1% of returns evokes discontent which equals satisfaction brought about by 2% gain.

According to Pompian (2006), the possibility of suffering losses is twice stronger motivating factor than the possibility of achieving the same absolute amount of profit. Investor with a strong aversion to risk will require at least two-dollar return per dollar of invested capital.

¹GDP of the Republic of Serbia in 2017 amounted to 39 billion EUR.

The *disposition effect* occurs as a result of loss aversion (Baker & Ricciardi, 2014). It implies that participants in the financial market sell securities that have appreciated in price since purchase (“winners”) too early, i.e. first chance they get (and thus hinder the achievement of even greater capital gain in the future), while they keep holding on for too long to losing securities (“losers”) - the selling of which will realize capital loss (and thus risk suffering even greater capital loss in the future). By selling the “winners” and holding on to “losers”, investors are exposed to increased tax burden. In short, they behave irrationally - as if they are trying to maximise their taxes.

The disposition effect is manifested in a large number of small gains being realised, and few small losses, therefore, it can be recognised in aggregate stock trading volume. During a bull market, trading volume increases, as investors seek to realize capital gains, while during a bear market, trading volume falls, as investors try to avoid losses (Ritter, 2003).

The answer to the earlier question of why investors do not sell “losers” and thus reduce the tax burden partly lies in the previously described aversion to loss.

8) Regret avoidance bias – Regret is the emotion caused by the failure to make right decision (Águila, 2009; Baker & Ricciardi, 2014; Bell, 1982). People suffer business losses much harder if they feel directly responsible for them (Águila, 2009, p. 57). Regret is a negative emotion that is stronger than the feeling of loss. In order to avoid regrets, investors often make bad investment decisions.

Regret is the pain that people feel when they realise that different choices would have led to better results. Regret is closely related to the responsibility for the choice made (Statman, 1999, p. 20). Regret arises due to: 1) acting erroneously, i.e. the feeling of doing something wrong (*errors of commission*) and 2) failure to act, i.e. not doing something one should have done (*errors of omission*). Errors of commission occur when an investor takes wrong moves which as a consequence have negative results, while errors of omission refer to the investor’s failure to act which causes him/her to miss the opportunity to earn profit. It should be noted that the feeling of regret, as a rule, is stronger in the case of adverse outcomes resulting from acting erroneously, than in the event of a failure to act (Pompian, 2006, p. 228).

Regret is different from disappointment, because in terms of regret, person is directly involved in achieving the negative outcome, whereas in terms of disappointment this is not necessarily the case. For example, the negative outcome which is a result of a bad decision made by a portfolio manager will make an investor feel disappointed, while the negative outcome which is a direct result of making a bad decision will evoke the feeling of remorse.

The two main ways to avoid regret include the transfer of responsibility for financial decisions made on hired financial experts and making common decisions such as buying shares of large, successful and well-known companies (*blue chip*

stocks). If the decisions made prove wrong, regret will be less painful if the investor has acted based on the advice of financial experts, or if he/she copied the moves of most market participants. On the other hand, regret will be greater if the investor is directly responsible for the decisions made, and especially if he/she based on his/her own assessment and intuition, has opted for risky shares of small and unknown companies.

Avoiding regret, in terms of avoiding the purchase of shares of small and unknown companies, and on the other hand buying the shares of large and well-known companies, is also an explanation for the behavioral *size effect*, i.e. the *small firm effect*. The avoidance of buying shares of small companies causes the smaller demand and thus depreciates the cost of small-cap shares, however, this increases the return. The purchase of shares of large companies increases their cost through increased demand and therefore reduces the return. Hence, the shares of small companies often generate higher returns, than the shares of large companies.

Regret avoidance bias often results in excessive tendency to avoid change (Nicolle et al., 2011) and excessive conservatism among investors in terms of undertaking new investment activities. The investor will refrain from making investment decisions if he/she has been exposed to regret due to misjudgments and wrong investment moves in the recent past. It is not difficult to conclude that excessive conservatism will result, on the one hand, in missing out on numerous opportunities to make profit, and in opting for low-risk investments that generate below-average returns, on the other hand.

Finally, it should be noted that regret avoidance bias is one of the causes behind the so-called herd mentality, because in their attempt to minimise regret, investors often decide to follow the moves of the majority of market participants.

9) Herd behavior, i.e. herd mentality or crowd psychology – Refers to the behavior of individuals, who rather than making their own estimations and moves opt to follow the crowd or a group, believing that the view of the majority is always right (Baddeley et al., 2012; Filip et al., 2015; Hirshleifer & Teoh, 2003; Scharfstein & Stein, 1990). They neglect the information that they have and blindly follow the behavior of the majority of market participants. Similar to many animal species who are herding because safety is in numbers, investors are monitoring and copying the moves of the largest group of investment public, thus trying to reduce the risk when making financial decisions and achieve security.

Such behavior of investors is particularly evident in conditions of higher uncertainty, lack of information, limited knowledge and personal experience. By copying the movements of others in a group, individuals are trying, on the one hand, to achieve social acceptance, and to avoid potential regret that would strike them in the event of incorrect personal decisions, on the other hand. Regret in case of a bad collective decision is lesser in degree than remorse in the case of a bad personal decision.

The tendency of individuals to make decisions consistent with decisions of the group or a community they belong to is called *conformity effect*. Individuals often prefer not to share their beliefs and keep them to themselves, especially if they are not in conformity with the beliefs of the community to which they belong. In this way, individuals reduce the risk of social isolation. When making a choice between the average loss caused by the decisions of their community and social isolation, people will in most cases opt for loss, because social isolation is painful. In addition, social isolation is an obstacle to further progress. Thus, individuals prefer short-term loss over the long-term isolation.

One important point to remember is that herd mentality, in terms of the identical or similar moves to the moves of the majority of market participants, often leads to the formation of the so-called speculative bubbles (Filip et al., 2015) that will burst sooner or later, thus, causing the crisis on the financial market.

10) Confirmation bias or self-confirmation bias – Refers to “collecting information in order to confirm one’s previously existing beliefs or ideas, rather than acquiring new knowledge or perhaps changing one’s attitude or beliefs. Information that is challenging or casting doubt on a person’s already formed position is simply ignored” (Kapor, 2014, p. 81).

Investors pay more attention and attach too much weight to information that confirms their opinion, while they underestimate and ignore information that contradicts their point of view. They are virtually searching for information that supports their existing point of view and ignore information that challenges it (Hammond et al., 1998). Deliberately excluding information from the analysis and underestimating opposing evidence, often leads to bad financial decisions, hence the name confirmation bias or *self-deception* (Coval et al., 2005) for this type of behavior. The investor does not handle the full spectrum of information, and therefore, his/her beliefs and decisions are unilateral.

11) Hindsight bias – after an unexpected turn of events, investors, unwilling to admit their mistake, often strongly believe that they knew all along what would happen and that the event confirmed their point of view (Kapor, 2014, p. 84). Past events, after the outcome is known, always seem easily predictable (Blank et al., 2007; Pezzo, 2011; Roese & Vohs, 2012). It is much easier to specify and explain the causes of an event after it occurs, rather than predict the same event specifying the same causes. The best example is the recent financial and economic crisis that the world’s best experts failed to predict; however, when the crisis struck, many economists were keen to explain its “obvious and easily predictable” causes. However, warning the investment and general public on the offset of a potential financial and economic crisis is much more important than recognising and explaining the causes of the crisis after it has occurred.

“After an event has happened, its realization in the light of new information seems inevitable, obvious and only possible. When reconstructing past memories about the

event, one unconsciously recognises the information that was unavailable at the time of prediction” (Kapor, 2014, p. 83). “A person believes that the beginning of a past event was predictable and completely obvious, despite the fact that the same event could have not been foreseen with absolute certainty. Many events, when reflected on, seem obvious and people seem smarter” (Brajković & Peša, 2015, p. 79).

Hindsight bias gives false security to investors when making their investment decisions and, more importantly, prevents them to learn from their mistakes. The fact that investors are not surprised by the realization of events in an unexpected way prevents the acquisition of new knowledge and valuable experience that are likely to be useful in the future (Pezzo, 2011). It is because of hindsight that investors retain their confidence; in addition, their overconfidence leads them to excessive risk-taking, which often has negative results. Investors believe they possess superior foresight and that is why they choose to expose themselves to excessive risk. In the event of poor performance, they block the memories of earlier thinking, forecasting and decision-making, believing that they knew from the start exactly what would happen and how things would turn out.

It is exactly the hindsight and overconfidence that behavioral theorists point to when explaining why the active portfolio strategy is still dominant strategy in the field of portfolio management, despite the overwhelming evidence of irrationality of its application.

12) Cognitive dissonance bias – Refers to the psychological discomfort that arises when our views and ideas are not consistent with our behavior (Baker & Nofsinger, 2002; Chang et al., 2016; Festinger, 1957; Olsen, 2008). It is a psychological and cognitive dissonance that causes a feeling of uneasiness and discomfort. For example, spotting a black swan, widespread mainly in Australia, may cause cognitive dissonance in individuals who, by that moment, were convinced that all swans were white. The discovery of black swans might have been a surprise for ornithologists in the time of the discovery of Australia, however, nowadays the term “black swan” is used as a metaphor for the unpredictable, rare, improbable, unexpected, and often extreme events with powerful effects, such as natural disasters, global financial and economic crisis, terrorist attacks.

Cognitive dissonance will occur if, for example, a consumer after having purchased a certain product which he/she considers superior on the market, receives information on the advantages another product. In an effort to avoid cognitive dissonance between the received information and the purchase made, the consumer will try to convince himself/herself that the product purchased was the best possible choice.

The above described examples of cognitive dissonance, on a mental level, infringe person’s identity, call into question the consistency in their perceptions and lead to imbalance. Individuals exposed to an unpleasant negative emotion experience tension which motivates them to reduce dissonance between their attitudes and

beliefs, on the one hand, and their behavior, on the other hand. The way to do this is to change either one's attitude or behavior. In order to maintain their psychological stability, people simply seek to synchronise their cognitions.

However, changes in behavior or attitudes for the sake of achieving cognitive harmony are not always rational and do not always lead to maximising personal interests. Investors, after investing in shares of a company and receiving information about the continuous decline in their value, often attribute negative results to bad luck and refuse to learn from their mistakes. They also avoid to sell such shares and realise capital losses, although they would avoid further losses and reduce the tax burden in this way. By avoiding to sell "losers", investors avoid psychological dissonance that comes from admitting to themselves that they made a bad investment decision (Chang et al., 2016). What is even more absurd is the fact that individual investors and portfolio managers, in response to cognitive dissonance, keep investing in "losers" in order to justify the prior decision on their purchase, thus *throwing good money after bad* (Lin et al., 2014). The described behavior of investors reduces cognitive dissonance; however, it is irrational in economic terms. This also gives us the answer to the question of why investors do not sell "losers" and thus reduce the tax burden.

13) Winner's curse – According to the standard financial theory, rational buyers and investors will never overpay real or financial assets they are interested in, because they are always aware of their intrinsic value. However, great number of auctions suggest that the best offer often exceeds the intrinsic value of the acquired assets, therefore winning the auction can be considered a Pyrrhic victory. The number of bidders and aggressive competition are the two main factors that hinder the rational bidding process. With the increasing number of bidders, the aggressiveness of bidding increases, and therefore the likelihood that the winning offer will exceed the intrinsic value of assets (Brajković&Peša, 2015; Holt & Sherman, 2014; Thaler, 1988).

The winner's curse is often associated with acquisitions of companies (Brander & Egan, 2017). If several bidders compete to acquire certain company, the winner will probably pay too much for it. The other bidders drop from bidding at one point, because they believe that the price offered by the winner is too high, or higher than the actual value of the company. It is clear to everyone, except the winner, that the company is worth less, and the majority is usually right.

4. Conclusion

Based on the outline of the above-described cognitive biases, it can be concluded that certain biases such as overconfidence, confirmation bias, self-confirmation and hindsight bias often make people, unjustifiably, feel good about themselves. Therefore, the aforementioned biases are the elements of self-deception.

Overconfidence makes people feel proud, because they believe that they possess greater knowledge and greater abilities than is really the case. Confirmation bias means underestimation of evidence that are contrary to the beliefs of the individual, and at the same time overestimating and overemphasising the evidence in favour of a formed belief, which ultimately results in being overconfident in one's abilities. Self-confirmation also makes people feel very good, because they believe that their skills are responsible for the success and blame external factors for eventual failures. Finally, hindsight contributions to people feeling better about themselves because they overestimate their prediction abilities (Shefrin, 2010).

By summarising cognitive biases, it can also be concluded that they are similar and intertwined. It is difficult to determine the precise boundary between the different cognitive biases. In other words, it is difficult to determine where one cognitive bias ends and another one begins. Instead of individual and isolated effect of a cognitive bias, it is more realistic to talk about their joint effect on the process of financial decision-making.

The paper affirms that cognitive biases hold the answer to many puzzling questions that representatives of standard of finance failed to answer, thus confirming the validity of the initial hypothesis. The dominant application of the active portfolio strategy and ignoring of the benefits of diversification of investments are explained by overconfidence and hindsight of portfolio managers and investors. The answer to the question of why investors prefer dividend payment over capital gain lies in mental accounting and self-control. The aversion to loss and avoidance of cognitive dissonance, i.e., psychological discomfort that is being evoked in investors when they realize that they have made a bad investment decision answers the question of why investors do not sell "losers" and thus reduce the tax burden. Finally, the small firm effect, i.e. the higher returns of small-cap shares in relation to shares of large-cap companies is explained by the cognitive bias called the regret avoidance bias.

The qualitative research methodology was used in the paper for the purposes of performing theoretical analysis, however, it was not used for the empirical analysis and verification of the initial hypothesis, which represents the key limitation of the paper, but at the same time, the suggestion for future research. Future research can be directed to the empirical confirmation of the presence of the above described cognitive biases and the identification of the new ones, as well as the empirical testing of the hypothesis that the knowledge about cognitive biases will be beneficial for investors, portfolio managers, financial analysts and other financial decision-making professionals in terms of improving the financial decision-making process.

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KOGNITIVNE PREDRASUDE KAO SASTAVNI ELEMENT BIHEJVIORALNIH FINANSIJA

Apstrakt: Složeni svet finansija odlikuju brojne iracionalnosti koje predstavnici bihevioralnih finansija nastoje da objasne putem kognitivnih predrasuda (nesavršenosti, pristrasnosti ili anomalija) (*cognitive biases*). Kognitivne predrasude predstavljaju nesavršenu percepciju stvarnosti, a uzrokovane su ograničenim kognitivnim kapacitetima donosilaca odluka. Cilj rada je da se analiziranjem kognitivnih predrasuda odgovori na sledeća, u standardnim finansijama neodgovorena, pitanja: zbog čega je aktivna portfolio strategija još uvek dominantna strategija upravljanja portfoliom uprkos sve većem broju dokaza neopravdanosti njene primene, zbog čega investitori preferiraju isplatu dividendi u odnosu na rast vrednosti kapitala (*dividend puzzle*), zbog čega zanemaruju prednosti diversifikacije ulaganja i investiraju u mali broj akcija dobro poznatih lokalnih preduzeća (*diversification puzzle*), zbog čega ne prodaju „gubitnike“ i na taj način smanje poresko opterećenje, zbog čega akcije malih preduzeća obično nose viši prinos od akcija velikih preduzeća. Primenom kvalitativne metodologije istraživanja pruženi su odgovori na navedena pitanja, što predstavlja i glavni rezultat istraživanja.

Ključne reči: kognitivne predrasude, bihevioralne finansije, finansijsko odlučivanje

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