



TRADITIONAL AND BEHAVIOURAL APPROACH TO RISK IN FINANCE

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Abstract: Making financial decisions under risk and uncertainty has become part of everyday life. Traditional finance explores the objective side of risk, analysing the decisions made by perfectly rational individuals in efficient market conditions. Behavioural finance seeks to connect theory with practice by combining elements of behavioural psychology with finance. The centre of interest of this theory is an individual with limited cognitive abilities and the tendency to make rational choices. The paper presents the risk component of financial and investment decisions from behaviour finance view point. In addition to precise “objective” measures, when expressing risk, subjective elements should be considered – investors’ risk perception and risk attitudes. This paper aims to highlight the key characteristics of the subjective elements of risk to obtain a full picture of the outcomes of financial decision-making. Based on the analysis of theoretical and empirical studies, we define challenges, as well as recommendations to individual investors regarding the influence of psychological factors when making investment decisions.

Keywords: traditional finance, behavioural finance, risk attitude, risk perception, investment decisions, cognitive biases, emotional biases.

JEL classification: G11, G14, G41.

1. Introduction

Numerous dilemmas relate to the way financial market participants make financial and investment decisions. Are individuals always rational or do they sometimes turn to emotional decision making? Do their attitudes influence investment decisions? Does everyone perceive risk the same or not? Investment decisions in finance are strongly linked to the risk that each of the alternatives carries with it. Although it has become a central aspect in defining business plans when creating investment strategies, controversies over risk measurement cannot be resolved for years.

Traditional finance bases its theory on decisions made by perfectly rational individuals in efficient market conditions. Practical examples very often deviate from these assumptions. The combination of elements of psychology with finance has given rise to behavioural finance – a new interdisciplinary research area that seeks to penetrate investment decisions that individuals make in real financial market conditions. The centre of interest of behavioural theory are individuals with their cognitive limitations and psychological causes of mistakes they make in decision making. An investor in behavioural finance has different risk attitudes and risk perceptions than a theoretical investor, which results in a different way of making decisions.

Proceeding from an individual as behavioural finance sees them, the research subject in this paper is investment decision-making viewed through the subjective aspect of risk. The paper aims to review the literature in this area and highlight the key characteristics of risk attitudes and perceptions, as well as their impact on financial and investment decision-making. In accordance with the above, the starting hypothesis is that an individual's risk attitudes and risk perception affect risk-taking. The paper brings new knowledge for the domestic community and investors, as well as recommendations on how to avoid the influence of emotions when making investment decision under risk.

In addition to the introduction and conclusion, the paper structure includes three parts. Within the first, we give a full picture of risk in finance through the analysis of two approaches – traditional and behavioural, with the corresponding decision-making models – normative and descriptive. The second part of the paper considers risk from the point of view of behavioural economics, i.e. defines and processes subjective risk components. By reviewing empirical and experimental research in the third part, special attention focuses on financial decision-making in conditions of uncertainty.

2. Risk in finance

Risk can be construed as the reality or possibility of threat which might be external or depend on decisions (Zinn, 2020, p. 17). Financial literature points to two

approaches of risk analysis – the *traditional*, which sees risk as a deviation of real from expected returns, and the *behavioural*, which relies on psychological elements of risk. At the core of these theories are two models of decision theory – normative and descriptive.

2.1. Traditional and behavioural finance

In the study of risk, traditional finance assumes an ideal environment with rational individuals and efficient market. A rational individual properly assesses all possible outcomes and makes decisions accordingly. As a result, the financial market is efficient. Markets are efficient if all relevant information is already incorporated into prices. Based on the above, in order to deeply analyse investment decisions when creating a portfolio, *Markowitz's (1952) Theory of Portfolio Selection* has emerged, also known as Modern Portfolio Theory. The decisions that an investor makes when choosing securities for the portfolio are viewed through the prism of the expected return and risk. For the purposes of their calculation, two parameters of the normal distribution of return probability are considered: arithmetic mean, as a measure of expected return, and standard deviation, as a measure of risk. Risk is defined as the possibility of suffering a loss, i.e. deviation of the actual from the expected return (Jakšić, 2016, p.63). Traditional finance assumes that rational individuals show a natural aversion to risk, i.e. they are not ready to accept more risk if they do not get extra return. The optimal investment decision is the selection of portfolio with the highest expected return for a given level of risk.

From the very beginning, until today, investors have struggled with the practical application of modern portfolio theory (Klement, 2018, p. 7). Despite its immeasurable contribution in the area of finance, risk as a function of actual and expected return did not fully explain the way investors make market decisions. In reality, the risk is determined by a much larger number of factors. Most of them are part of the psychological nature of the individual. John Maynard Keynes points out that future-related decisions are not based only on mathematical calculations of probability and expectations because the world is full of uncertainty (Ackert, 2014, p. 26). Unlike traditional finance, which has continued its research path in the direction of finding new mathematical models to explain the financial decisions of individuals, behavioural finance seeks to add cognitive psychological elements to sophisticated mathematical and statistical models by observing and studying the behaviour of financial entities (Todorović, 2010, p. 63).

Practical examples differ from traditional finance assumptions. Irrationality in individual behaviour (for example: imitating the behaviour of other individuals) has been observed, which leads to the mispricing of assets on the market. Although the application of arbitration strategies can eliminate the resulting price anomalies, research shows that these operations are very often expensive and risky (Bachmann

et al., 2018, p. 1). Consequently, irrational individuals and limited arbitrage strategies lead to inefficient markets.

The assumptions behind behavioural finance correspond to real financial market conditions. The two building blocks of this theory are cognitive psychology (people are not rational) and the previously mentioned limited arbitrage (markets are not efficient) (Cartwright, 2018). The psychological aspect in finance explains the behaviour of individuals when making investment decisions, which are often the product of emotional states, misunderstandings, the use of inappropriate rules of thumb also called heuristics to handle information, and so on. Unlike traditional finance, where financial decisions are related to investor preferences for a given level of risk, behavioural finance recognizes the importance of risk perception as a subjective measure. Actual risk cannot be expressed only by precise “objective” measurements, but also subjective elements should be considered – investors’ risk perception and risk attitudes (Ricciardi, 2008b, p. 28).

2.2. Normative and descriptive model of decision-making

The classical decision-making approach based on the normative model in which an individual seeks to find the best or optimal decision has been a good basis for the development of traditional finance. Normative decision theory assumes that as perfectly rational individuals we are able not only to precisely define a problem and set goals but also to form a set of all alternatives that we can realize to varying degrees (Pavličić, 2018, p. 9). Rational individuals do not make calculated or logical mistakes to achieve the defined goals. Markowitz (1959) compares a rational individual to “a computer that has unlimited speed and capacity in processing all information”. Although such individuals do not exist in the real world, theories based on these assumptions should serve to formulate general principles that they would use as a kind of “guide” in decision-making. Normative decision theory provides an answer to the question – *how to decide*?

The world we live in is full of uncertainty whose outcomes we cannot predict, nor the probabilities of their occurrence. As for rational choices in conditions of risk, it is not enough to prefer one option over another, but we need to know how much we prefer it. The utilities we attribute to particular outcomes shape our decisions. By comparing the expected utilities represented by the sum of utility products and the probability of occurrence, we come to the choice of outcomes with the maximum expected utility (Peterson, 2017). The utility function is not universal, but its form depends on the subjective preferences of each individual. The obtained form of the utility function reveals risk attitude, where the observed decision-maker can be characterized as risk-seeking, neutral, or risk-averse.

Based on the assumption of a rational individual, theories have emerged that perfectly describe the forms of behaviour and decision-making in different conditions. However, it is impossible not to notice that perfectly rational

individuals are not part of reality. Are we then in practical choices guided by the principles of normative theory? How do ordinary people with limited cognitive abilities make decisions based on available, rather than complete, information? Are the numerical values of outcomes in practice always known to us in advance, or do we sometimes indulge in predictions due to their lack? Numerous controversial issues that intertwine in the normative model of decision-making have been the basis for the development of theories that belong to the descriptive decision-making model.

Behavioural theory, as one of the theories that belong to the descriptive model of decision-making, seeks to discover how individuals actually make decisions in reality (Ackert, 2014, p. 31). Theorists agree that individuals are not irrational; on the contrary, they strive to make rational decisions but at the same time are limited by the resources and abilities they possess. The centre of interest of behavioural theory are the decision-makers, with their cognitive limitations and the psychological causes of the mistakes they make in decision making. The perfectly rational decision-maker is now replaced by Herbert Simon's concept of bounded rationality (1955). As opposed to striving for the *optimal*, people focus on solutions that complement their needs, i.e. they tend to make decisions that meet a predetermined *level of aspirations*. Table 1 summarizes all risk explanations based on the normative and descriptive model of financial decision-making.

Table 1 – Risk dimensions under traditional and behavioural finance

	Traditional finance (normative model of decision-making)	Behavioural finance (descriptive model of decision-making)
Risk preference	Expected returns and volatility	Gains and losses (with respect to reference point) Loss aversion Uncertainty aversion Investment temperament
Risk awareness	Rationality No misperception	Behavioural biases Financial knowledge (Experience)

Source: Bachmann et al., 2018, 154

As the previous table shows, the differences between a rational and an individual with limited rationality are visible in the field of risk, which further indicates the differences in investment decision-making. *Prospect Theory* is one of the best known and most widely accepted alternatives to *Expected Utility Theory*. It was developed by Kahneman and Tversky (1979). *Prospect Theory* seems to

describe the model of decision-making between risky options, as well as the reasons why these choices deviate from rational ones. Maximizing expected utility has been replaced by value maximization. The key contribution of the theory is reflected in the evaluation of outcomes based on changes in wealth (Bachmann et al., 2018, p. 78). As we are not able to process all relevant information when making decisions, we evaluate options under the set norm, which can represent the desired level of aspirations. All positive and negative deviations from the reference point are valued as gains and losses. Unlike normative theory, where changes in the outcome probability (whether it is a loss or a gain) are treated in the same way, the prospect theory seems to indicate that the same changes in the probability in the gain zone and the loss zone are not experienced in the same way. The observation that our losses appear to be greater than gains of the same size is called *loss aversion* (Kahneman & Tversky, 1979). The manifested risk behaviour of decision makers when choosing different alternatives is also significantly different when deciding on gains to losses. In the context of gains, individuals show aversion to risk when making decisions, that is, they would rather accept safe gain than a lottery¹. When faced with a choice of risky options associated with losses, individuals show a propensity for risk, that is, they are more inclined to the lottery than face a certain loss.

3. Psychological dimensions of risk in finance

Different aspects of observing traditional and behavioural finance have led to disagreements in defining the components that create risk. While standard portfolio theory relies on a component of risk attitudes in the form of individual propensity to take risks, behavioural finance introduces a component of risk perception in addition to risk attitude. Risk perception and risk attitude are related and often confusing variables that independently of each other influence risk behaviour (Hoffmann et al., 2015).

3.1. Risk attitude

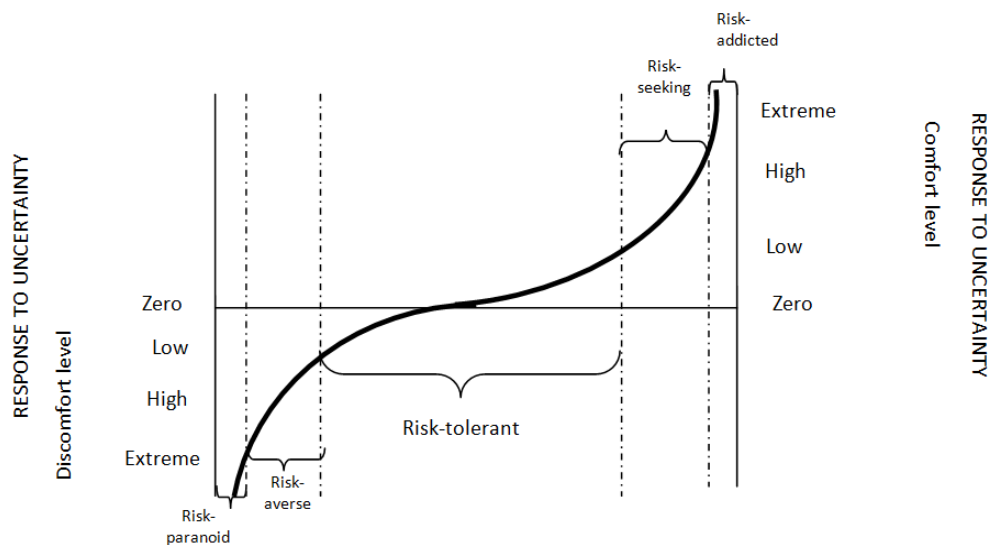
It is more than obvious that we all make financial decisions in different ways under risk and uncertainty. Despite the importance attached to risk in financial theory, defining its components lacks precise terminology. Roszkowski and Davey (2010) point out that financial literature identifies risk attitude as risk tolerance, risk acceptance, risk appetite, risk propensity. Common to these terms is that they represent the degree of risk that the individual is willing to accept. Contrary to the identification of the terms of risk tolerance and risk attitude, Grable (2017) makes a difference. Risk tolerance is a broader term and represents the amount of risk that an individual is willing to accept to achieve their goal. In addition to risk attitude,

¹ Risky option presented in the form of lottery with at least two possible outcomes.

risk tolerance includes risk capacity. Risk attitude determines the degree of willingness of an individual to take financial risk, while risk capacity refers to the real financial capacity to accept risk. Most often, objective measures such as age, income, and financial stability are considered when measuring risk capacity. On the other hand, risk attitudes are considered a more subjective measure, given that the emotions of investors are included in its expression.

Risk is a measurable uncertainty, precisely, a situation in which the probabilities of occurrence of certain events are known. Hillson and Murray-Webster (2007) view attitude as "a chosen state of mind, or, a mental vision of certain facts." Combining the above, risk attitudes can be defined as a mental view of all risk events whose probabilities of realization we know. The answer to the question of how much risk we are willing to take in certain situations depends on our attitudes ("What is my view of this situation?") and perceptions ("How much uncertainty is there?" and "What is the impact of uncertainty on goals?"). The position that an individual occupies on the continuum from risk-aversion to risk-seeking indicates the risk attitude of the observed individual. An illustration of risk attitude is given in Figure 1.

Figure 1 – Spectrum of risk attitudes



Source: Hillson and Murray-Webster, 2007, 45

Figure 1 shows three groups of individuals. In the first half of the graph, the extreme left coverage of the curve consists of individuals who show risk aversion, while the upper right part of the curve shows the attitude of individuals who are prone to risk. Between these two categories, in the middle, is a flattened curve that encompasses individuals or groups that are more or less indifferent to risk.

A large number of financial decisions are influenced by risk attitude. It is expected that people will make different investment decisions according to their different risk attitudes. Different attitudes towards the same situation result in different behaviour of individuals or groups, so there are noticeable differences in everyday consumer decisions, decisions regarding the debt-to-savings ratio, the use of credit cards, etc. Different risk attitudes of an individual are also present when the time horizon of investment is considered. Risk-seeking individuals are more willing to make aggressive, high-risk investments in the long run and vice versa (Grable, 2017). Therefore, investment advisors, when creating their clients' portfolios, in addition to returns and investment periods, include risk attitude as a key determinant. The content of the securities portfolio thus clearly shows individuals' risk attitude.

The importance of determining risk attitude based on all of the above is great. Nevertheless, the ways to measure it are a real challenge. Expected utility theory is a traditionally used method for conceptualizing risk attitudes. It presents risk attitudes as a descriptive measure that determines the form of the utility function assumed to be at the core of human choices. There is a growing body of evidence that calls into question the assumption that risk appetite is not subject to change. Weber et al. (2002) developed a domain-specific risk-attitude scale and conducted an extensive study of risk attitudes in five different decision-making areas (finance, health, sports, ethics, and sociology) to find that the degree of risk exposure of individuals was closely related to the field of observation, that is, there was no consistency in risk aversion or risk seeking in all areas.

3.2. Risk perception

Supporters of behavioural finance have noticed that investors' preferences for a given risk level are not the only component that influences the choice of financial decisions. How individuals perceive and react to risk is also an equally important factor. Perception represents our awareness of the world and our place in it. From a psychological point of view, perception means the final sequence of a process that begins with the activation of sensory systems, involves processing in the nervous system, and ends in an organized and meaningful experience that gives meaning to presented information or environment (Žiropada, 2012, p. 59). Perception is the process in which an individual seeks to interpret sensory information to decide based on previous experience and levels of expertise. In short, perception can be characterized as a subjective reflection of objective reality.

In the social sciences, the risk is expressed by perception as a subjective measure based on cognitive assessments. Analogous to the previous, risk perception is a subjective view of actual risk or "the way people see or feel toward a potential danger or hazard" (Ricciardi, 2008a, p. 86). Unlike subjective risk, the objective risk is quantitative, based on numerical statements of past events to

assess the risk of financial security, situation, or decision (Ricciardi & Rice, 2014, p. 9). Also, the objective risk is more accurate to observe and thus easier to measure. Followers of traditional finance develop models of financial management based on objective risk. From the point of view of behavioural finance, the subjective aspect of risk (the impact of mental-cognitive and affective-emotional issues) plays a key role in defining, assessing, and explaining risk. Rather than looking at the financial perspective of one-dimensional measures of the theoretical concept of risk, people make judgments based on an assessment of the potential danger. Numerous studies (Glaser & Weber, 2005; Wang et al., 2009; Statman, 2014; Cohn et al., 2015) have confirmed that the way we perceive risk is influenced by a large number of factors. Zinn (2020) singles out the following: intuitive heuristics (anchoring effect), overconfidence, estimates of average losses over time, consequences of a risk event, connection to a source of risk, credibility and trust in agencies and institutions that handle risk, media coverage of risk-related information, opinions of other reference groups (herding effect) and personal experience with risk.

The variety of factors that influence the formation of perceptions in the decision-making process makes people have different, sometimes even opposing views of the same situation (Ricciardi & Rice, 2014). Risk perception is best utilized with an approach that is interdisciplinary and multidimensional for a given decision, situation, activity or event (Ricciardi, 2008a, p. 87). From a financial point of view, risk perception is a loss that an investor believes exists in the purchase of financial service or product of a particular company. It contains all the objective and subjective factors that influence people's opinions about financial services. As an *ex ante* measure, it can be based on realized returns, fundamental analyses, and all information that portfolio managers believe is related to risk. Even when all risk measures are known, the subjective perception still exists, because the personal experience of loss exposure is different for everyone.

Previous research has focused solely on the individual and the way decisions are made, while group observations and analyses by sociologists have provided deeper information on the sociological, cultural, and organizational factors that influence risk perception. Individualism, aversion of uncertainty, the importance of tradition, trust, fairness, or democratic values are just some of the social characteristics that determine the way people perceive and interpret risk. Wang et al. (2009) study includes investors from 45 countries, intending to determine time preferences for cash flows. The researchers found that the main reason for choosing smaller payments in the present versus larger amounts that would be paid to them somewhat later in the future is the difference in risk perception between countries. Countries where investors perceive greater uncertainty regarding delayed cash flows opt for immediate payment. Countries with such results include the country in the Serbian region – Bosnia and Herzegovina, as part of this international research. In addition to cultural differences with other countries,

differences in economic circumstances also contributed to different risk perceptions. Bordalo et al. (2020) explain that higher risk perceptions are present among investors in countries with high political, economic and legal instability.

Special attention is drawn to research examining how unexpected circumstances affect risk perception. Glaser and Weber (2005) examine the impact of the crisis caused by the bombing of the World Trade Center twin towers on September 11. Due to the resulting economic uncertainties, they find a greater gap in the assessments of investors after, compared to the period before the attack. Further explanations are related to the anchoring and adjustment heuristic effect which is commonly used in numerical predictions when a relevant value representing the anchor is available. The 2008 global economic crisis provided an opportunity for Hoffmann et al. (2015) to examine and compare risk attitudes and risk perceptions of investors before and after the crisis. The results show that attitudes towards risk changed slightly and that there was a large change in perceived investment risk.

4. Investment decisions under uncertainty

When making investment decisions, investors include elements of risk and uncertainty in the analysis. Based on probability calculations, financial models adequately reflect risk conditions while, on the other hand, decisions made under uncertainty are based on subjective reasoning. Roszkowski and Davey (2010) see risky investments under uncertainty as a function of 1) perceived probabilities of risk alternatives; 2) perceived consequences and 3) psychological preferences of the individual in taking risks, that is, the risk attitude of the individual. In short, risky investment is determined by the risk that an individual perceives in a particular investment and their willingness to perform at that level of risk.

The financial decisions that individuals make are the result of their thoughts and feelings. In the process of collecting, interpreting, and processing market information, investors can be unknowingly influenced by past experiences and personal beliefs to such an extent that even the decisions of professionals in these areas sometimes differ from logic. Influences of this kind are called biases or preferences in decision-making. The broadest division of bias is into cognitive and emotional. Cognitive bias is related to the thought process, while emotional one is the result of feelings (Pompian, 2018, p. 19). In the case of cognitive errors, the causes should be sought in the incorrect processing of information. Wang et al. (2011) found that research participants rated financial instruments as less risky if they were easier to understand and vice versa, which is associated with familiarity bias. Due to lack of knowledge, individuals may overestimate the risk of a particular investment. Another cognitive bias is the tendency to make statistical conclusions, which can lead to confusing beliefs when considering the probability of certain events occurring. Events that are not impossible are often underestimated

in analyses (Rengifo et al., 2014, p. 443), because the subjective probability of the occurrence of an event depends in part on recent experience. If in the previous period events such as the complete collapse of the market were absent, they have attributed a small chance of occurrence in the future.

Unlike cognitive, emotional bias is not based on facts, but feelings. An individual's emotional state can have a strong influence on investment decisions. Concerns or positive emotions affect the investor's risk perception. Emotion is defined as a state of consciousness accompanied by subjective experience, physiological changes, and expressive reactions (Žiropada, 2012, p. 189). The influence of emotions mainly refers to a set of primary emotions: joy, anger, fear, and sadness. Confusing emotions such as fear make investors sell securities in a phase of decline of economic activity in the market due to increased risk perception and reduced perception of future returns, while in a phase of great rise when risk perception is reduced and yield perception is increased, securities are bought *en masse* (Statman, 2014, p. 72). When emotion is very intense and brings a person into a state characterized by partial or complete disorganization of behaviour, we talk about affects (Finucane, 2012, p. 60). Trust is one of the most well-known affective states and at the same time the key to positive interpersonal relationships because it represents the core of cooperation with other people (Siegrist, 2021, p. 481). Olsen (2012) points out that the flourishing of high-tech development in the early 1990s was accompanied by an increase in public confidence, which influenced the formation of rational price bubbles on the capital markets. The feeling of trust further influenced the public opinion that the increased funds reflect security and safety.

The emergence and consequences of global financial crises have prompted the scientific community to reconsider the behaviour, decisions, and activities of individuals that have led to such outcomes. How do individuals react in crises with high uncertainty and falling stock prices, what affects financial investments, how and why do changes occur with the onset of economic shocks, and how long does that change last? These are just some of the questions that need to be answered.

Risk events can be viewed through two dimensions. The first refers to risks with a high frequency and clear causal relationship. The second dimension includes risks that occur infrequently, with an unclear cause-and-effect relationship and the characteristic of a severe shock, as is the case with market crashes (Rengifo et al., 2014, p. 440). The 2008 global economic crisis is a prime example of what Taleb (2007) calls the "black swan" – an extremely unbelievable financial event that defies common financial analysis in which probabilities show that such turmoil is unlikely to be ruled out. The crisis of 2008 showed that market participants in the quest to maximize return did not pay enough attention to risk (Todorović et al., 2015, p. 168). The period of excessive optimism and irrational behaviour of investors led to the emergence and deepening of the crisis. The panic conditions that appeared on that occasion were a consequence of the effect of regret and the

effect of the herd. To minimize regret, individuals followed the reactions of other market participants and engaged in panic sales so as not to lag behind other participants. Prices continued to fall, leading to continued forced sales. Regret often discourages investors from realizing a loss, even though it brings with its tax benefits, while pride encourages them in realizing gains that are tax burdened (Statman, 2014, p. 72).

Financial investments in the phases of ups and downs on financial markets have also been the subject of experimental economic research. The observed trends of growth of the risk premium on the capital markets during the recession and vice versa, the decline of the risk premium in the period of increasing economic activities were examined. Cohn et al. (2015) believe that the market anomaly of high volatility in securities price movements over time can be explained by countercyclical risk aversion. Participants in an experimental study conducted by the same authors were subjected to scenarios of expansive growth and decline in economic activity. The results show that a group of investors faced with a decline in economic activity expressed a greater aversion to risk, suggesting that fear as a psychological factor played an important role in this process. Beaud and Willinger (2015) experimental study examined investor risk exposure. Participants were faced with the dilemma of choosing to invest in risky and non-risky assets in two different contexts – the presence and absence of systemic risk. Over 80% of respondents increased their investments in risky assets when they were not exposed to systemic risk that could affect their initial wealth.

The pattern of investor behaviour in experimental research was also there at the beginning of 2020 when the world financial markets faced the challenge of overcoming the systemic risk caused by the rapid spread of the COVID-19 virus epidemic. Uncertainty due to the blockade of the world's largest economies undermined investor confidence. The emergence of unexpected risk led to huge losses for investors in a very short period. The data indicates that investors withdrew 94 billion dollars from the capital market in March 2020 (Financial Times, 2020). Within 100 days, 30% of wealth disappeared from world stock markets (Ali, et al., 2020, 6). The money was invested in liquidity and less risky forms of assets such as short-term government bonds and money market funds. This is in line with Weber, et al. (2013) who point out that changes in financial markets, in the form of allocation of funds from risky to risk-free financial instruments, occur in response to market events. In search of a safe haven for their investments during a pandemic, research by Ji et al. (2020) confirms that gold has an irreplaceable role in preserving the value of investments.

5. Conclusion

Risk and uncertainty do not belong only to mathematical and statistical concepts, but for their understanding it is necessary to include psychological elements. The

way people view the risks of financial instruments is the first step towards understanding the decisions they make when investing. Individuals strive to make rational decisions, but at the same time, they are limited by the resources and abilities they possess. In addition, individuals often resort to the use of developed shortcuts, rules, or heuristics in the processing of market signals. Followers of behavioural finance point out that the subjective aspect of risk (the impact of mental-cognitive and affective-emotional issues) plays a key role in defining, assessing, and explaining risk.

Risk perceptions and risk attitudes can influence behaviour and shape the decisions we make. Risk attitudes vary depending on the area of observation. Specifically, it has been observed that aversion or risk-seeking will not be the same in decisions made in finance, health, sports, or any other area of observation. When it comes to one area, attitudes remain almost unchanged while perceptions are the ones that most influence the change in risk behaviour. Perceptions make people have different, sometimes even opposing views of the same situation. Higher risk perceptions are present among investors in countries with high political, economic, and legal instability.

The literature on behavioural finance testifies to a significant number of cognitive and affective limitations present when assessing risk perceived by investors of a wide range of financial instruments (stocks, money market funds, etc.) and financial services (tax planning, selection of financial advisor, etc.). Uncertainties on the market have led to changes in human behaviour, with countercyclical risk aversion observed, where risk aversion appears as a psychological factor in the recession phase due to increased fear. The onset of the crisis is preceded by a period of excessive optimism and irrational behaviour of investors on the financial market. With the emergence of market uncertainty, investors sell or allocate funds from risk to risk-free financial instruments. A large drop in stock prices on the stock market, combined with negative emotions such as fear, increase the risk perception of investors and encourage further sales of securities. To minimize regret, other individuals follow the reactions of other market participants and engage in panic sales. The end effect of these actions is the complete collapse of financial markets.

By theoretically processing the psychological aspects of risk, the paper seeks to provide the domestic community and investors with the knowledge that can contribute to more successful decision-making. The paper can serve as a significant tool for financial advisors to better understand their clients. Getting acquainted with the patterns of behaviour and psychology of clients contributes to improving the work of financial advisors and strengthening the relationship between client and advisor. New views on risk can also help define long-term investment strategies for individual investors. As noted in Jones (2012), summary recommendations for investors would be to rely less on their intuition and feelings, to base purchase or sale decisions on relevant, predictable information instead of

historical data, and to sell securities on the market guided solely by the tax consequences of such an act, rather than the original price at which the security was purchased. In situations where the future is uncertain, as is the case with the COVID-19 virus pandemic, with the recommendation that the impact of emotions on decision-making should be reduced to avoid panic sales, investors should maintain confidence in a well-diversified securities portfolio, then determine an adequate degree of risk tolerance, which, in addition to risk attitudes, includes the financial capacity to take risks and form reserve funds on time by investing in assets that can preserve their value during the crisis.

The derived conclusions and recommendations are based on a theoretical analysis of literature in this field, with empirical confirmation of the starting hypothesis missing, which is also a limitation of the observed research. Consequently, the directions of future research go towards empirical verification of the influence of risk attitudes and risk perceptions on the outcome of financial and investment decision-making.

References

- Ackert, F. L. (2014). Traditional and Behavioral Finance. In: Baker, H. K., & Ricciardi, V., editors. *Investor Behavior – The Psychology of Financial Planning and Investing*. New Jersey, USA: John Wiley & Sons, Inc.
- Ali, M., Alam, N., & Rizvi, S. A. R. (2020). Coronavirus (COVID-19)—An epidemic or pandemic for financial markets. *Journal of Behavioral and Experimental Finance*, 27, 1-6.
- Bachmann, K., De Giorgi, G. E., Hens, T. (2018). *Behavioral Finance for Private Banking*. 2th ed. New Jersey, USA: John Wiley & Sons, Inc.
- Beaud, M., & Willinger, M. (2015). Are people risk vulnerable?. *Management Science*, 61(3), 624-636.
- Bordalo, P., Gennaioli, N., Ma, Y., & Shleifer, A. (2020). Overreaction in macroeconomic expectations. *American Economic Review*, 110(9), 2748-2782.
- Cartwright, E. (2018). *Behavioral economics*. 3rd ed. London, UK: Routledge.
- Cohn, A., Engelmann, J., Fehr, E., & Maréchal, M. A. (2015). Evidence for countercyclical risk aversion: An experiment with financial professionals. *American Economic Review*, 105(2), 860-885.
- Financial Times, April 10, 2020, Coronavirus fight helps lift global equity funds.
- Finucane, M. L. (2012). The role of feelings in perceived risk. In: *Essentials of risk theory* (pp. 57-74). Dordrecht: Springer Netherlands.
- Glaser, M., & Weber, M. (2005). September 11 and stock return expectations of individual investors. *Review of Finance*, 9(2), 243-279.
- Grable, J. E. (2017). *Financial risk tolerance: A psychometric review*. CFA Institute Research Foundation.
- Hillson, D. & Murray-Webster, R. (2007). *Understanding and Managing Risk Attitude*. 2th ed. Aldershot, England: Gower Publishing Limited.
- Hoffmann, A. O., Post, T., & Pennings, J. M. (2015). How investor perceptions drive actual trading and risk-taking behavior. *Journal of Behavioral Finance*, 16(1), 94-103.

- Jakšić, M. (2016). *Finansijsko tržište – instrumenti i institucije*. Kragujevac, Republika Srbija: Ekonomski fakultet Univerziteta u Kragujevcu.
- Ji, Q., Zhang, D., & Zhao, Y. (2020). Searching for safe-haven assets during the COVID-19 pandemic. *International Review of Financial Analysis*, 71.
- Jones, B. (2012). Behavioral Finance 2.0. *Journal of Portfolio Management*, 38(4), 1.
- Kahneman, D. & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47, 263-291.
- Klement, J. (2018). Investing is Rational, Money is Emotional. In: Klement, J., editor. *Risk Profiling and Tolerance: Insights for the Private Wealth Manager*. CFA Institute Research Foundation.
- Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance*, 7(1), 77-91.
- Markowitz, H. (1959). *Portfolio selection: Efficient diversification of investments*. New York, USA: John Wiley.
- Olsen, R. (2012). Trust: The Underappreciated Investment Risk Attribute. *Journal of Behavioral Finance*, 13, 308-313. doi: 10.1080/15427560.2012.735728
- Pavličić, D. (2018). *Teorija odlučivanja*. Beograd, Republika Srbija: Ekonomski fakultet Univerziteta u Beogradu.
- Peterson, M. (2017). *An introduction to decision theory*. Cambridge University Press.
- Pompian, M. (2018). Risk Profiling through a Behavioral Finance Lens. In: Klement, J., editor. *Risk Profiling and Tolerance: Insights for the Private Wealth Manager*. CFA Institute Research Foundation.
- Rengifo, W. E., Trendafilov, R., & Trifan, E. (2014). Behavioral portfolio theory and Investment Management. In: Baker, H. Kent and Ricciardi, Victor (eds.). *Investor Behavior – The Psychology of Financial Planning and Investing*. New Jersey, USA: John Wiley & Sons, Inc.
- Ricciardi, V. (2008a). The Psychology of Risk: The Behavioral Finance Perspective. In: Fabozzi Frank J. (ed.). *Handbook of Finance, Volume II: Investment Management and Financial Management*. New Jersey, USA: John Wiley & Sons, Inc. doi: 10.1002/9780470404324.hof002010
- Ricciardi, V. (2008b). Risk: Tradicional Finance versus Behavioral Finance. In: Fabozzi Frank J. (ed.). *Handbook of Finance, Volume III: Valuation, Financial Modeling, and Quantitative Tools*. New Jersey, USA: John Wiley & Sons, Inc. doi: 10.1002/9780470404324.hof003002
- Ricciardi, V., & Rice, D. (2014). Risk Perception and Risk Tolerance. In: Baker, H. Kent and Ricciardi Victor (eds.). *Investor Behavior – The Psychology of Financial Planning and Investing*. New Jersey, USA: John Wiley & Sons, Inc.
- Roszkowski, J. M., & Davey, G. (2010). Risk Perception and Risk Tolerance Changes Attributable to the 2008 Economic Crisis: A Subtle but Critical Difference. *Journal of Financial Service Professionals*, 64, 42-53.
- Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics*, 69(1), 99-118.
- Statman, M. (2014). Behavioral finance: Finance with normal people. *Borsa Istanbul Review*, 14(2), 65-73.. doi: 10.1016/j.bir.2014.03.001
- Siegrist, M. (2021). Trust and risk perception: A critical review of the literature. *Risk analysis*, 41(3), 480-490.
- Taleb, N. N. (2007). *The black swan: the impact of the highly improbable*. New York, USA: Random House.

- Todorović, Miroslav. M. (2010). Uvod u bihevioralne finansije. *Računovodstvo*, 9-10, 63-75.
- Todorović, V., Vuksanović, E., & Jakšić, M. (2015). Comparative analysis of the causes and consequences of representative banking crisis. *Teme*, 39(1), 159-174.
- Wang, M., Rieger, M. O., & Hens, T. (2009). An international survey on time discounting. Norwegian School of Economics working paper.
- Wang, M., Keller, C., & Siegrist, M. (2011). The Less You Know, the More You Are Afraid of—A Survey on Risk Perceptions of Investment Products. *Journal of Behavioral Finance*, 12(1), 9-19. doi: 10.1080/15427560.2011.548760
- Weber, U. E., Blais, A., & Betz, E. N. (2002). A Domain- specific Risk-attitude Scale: Measuring Risk Perceptions and Risk Behaviors. *Journal of Behavioral Decision Making*, 15, 263-290. doi: 10.1002/bdm.414
- Weber, M., Weber, E. U., & Nosić, A. (2013). Who takes risks when and why: Determinants of changes in investor risk taking. *Review of Finance*, 17(3), 847-883.
- Zinn, J. O. (2020). *Understanding risk-taking*. Cham, Switzerland: palgrave macmillan.
- Žiropada, Lj. (2012).. *Uvod u psihologiju*. Beograd, Republika Srbija: Čigoja štampa.

TRADICIONALNI I BIHEVIORALNI PRISTUP RIZIKU U FINANSIJAMA

Abstrakt: Donošenje finansijskih odluka u uslovima rizika i neizvesnosti postalo je deo svakodnevice. Tradicionalne finansije istražuju objektivnu stranu rizika, analizirajući odluke koje donose savršeno racionalni pojedinci u uslovima efikasnog funkcionisanja tržišta. Bihevioralne finansije nastoje da povežu teoriju sa praksom spajanjem elemenata psihologije ponašanja sa finansijama. Središte interesovanja ove teorije čini pojedinac sa ograničenim kognitivnim sposobnostima i težnjom ka donošenju racionalnih odluka. U radu je predstavljena komponenta rizika finansijskih i investicionih odluka iz ugla bihevioralnih finansija. Pored preciznih „objektivnih“ mera, prilikom izražavanja rizika u obzir treba uzeti i subjektivne elemente - percipirani rizik od strane investitora i stavove, odnosno, sklonosti prema riziku. Cilj rada je isticanje ključnih karakteristika subjektivnih elemenata rizika kako bi se dobila celovita slika o ishodima finansijskog odlučivanja. Na osnovu analize teorijskih i empirijskih istraživanja definisani su izazovi, ali i preporuke individualnim investitorima u vezi uticaja psiholoških faktora prilikom donošenja investicionih odluka.

Ključne reči: tradicionalne finansije, bihevioralne finansije, rizični stavovi, rizične percepcije, investiciona ulaganja, kognitivne pristrasnosti, emocionalne pristrasnosti

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