

## **Behavioral finance theories towards traditional finance theories**

### **Literature review**

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#### **Abstract**

Traditional Finance and Behavioral Finance try to explain investor's behavior with different arguments and theories. The simplest way to think, is to think about theories of traditional finance how financial markets should function and how investors should behave in an ideal world, whereas for behavioral finance theories, how financial markets function and how investors actually behave in the real world. Understanding both theory and reality, helps investors in making better investment decisions. This paper aims to summarize the main theories of Traditional Finance and Financial Behavior based on the existing literature for the two schools of thought.

**Keywords:** Traditional Finance, Behavioral Finance, Theories, Investing Decision.

#### **Introduction**

Over the years, researchers have been trying to understand how human behavior and the way its brain works affects decision-making. They recognize the influence of the human psychological factor on financial decision-making and market events. The influence of Psychology in Finance has been studied by Keynes since the 1920s, who emphasizes that uncertainty makes people's future decisions, not only depend on their mathematical expectations, but also on other important factors for decision-making such as caprices, attitudes, or even just luck. Traditionally, academics in the field of finance have had an enthusiastic approach in using mathematical models as well as a consistent tendency to mathematize the study of financial behavior.

Over the last 60 years, traditional finance theories have shown that investors are rational, well-informed, firm, and not affected by emotions when they make financial decisions. Based on surveys, the reality is that they rarely behave according to the above assumptions. Recent developments in Finance have focused more and more on the human aspect of the investor in the decision-making process. This idea was strongly supported by academic and professional circles generating a new field in Finance: Financial Behavior, a multidisciplinary research field which studies investor's psychology during financial decision-making process and also integrates psychology with finance. Behavioral Finance studies the factors that influence the financial decision-making process of investors, and explains their irrational nature. It tries to explain investor's decisions by combining psychology and finance knowledge in both micro and macro level (Investor Behavior, 19, p. 7). In 2002, Daniel Kahneman, a researcher in the Behavioral Economics, was awarded with the Nobel Prize in Economics (Michael M. Pompian and John M. Longo, 2004). The most famous and classic theories in finance such as Efficiency Markets, Modern Portfolio Theory, CAPM Model, the theory of Expected Utilities, assume that the investor is rational, elaborates

available information, and aims to maximize the expected benefits (Bilgehan Kubilay, Ali Bayrakdaroglu, 2016). Contrary to the classic theory of Expected Utility, DeLong et al. 1990 further develops The Theory of "Prospect", which is believed to have a higher level of explanatory power on how investors make their own decisions. Nicholas Barberis (2013) also elaborates this theory in its details. Researchers have noticed many cases of market inefficiencies, for example, different anomalies and investors' irrational behavior (Johnson et al., 2002). Many contemporary researchers believe that people cannot behave rationally in investment decisions (Shephrin, 2000; Shleifer, 2000; Taleb 2004). There are many factors that influence this behavior (Read, D. & Loewenstein, G, 1999), and the most important are the psychological ones.

### **A general view of Classical Economics Theories**

*"Standard Finance is the knowledge built on the principles of arbitrage of Miller and Modigliani, Markowitz's portfolio principles, Sharpe, Lintner and Black CAPM model, and Black, Scholes and Merton's option pricing theories."*

*Meir Statman*

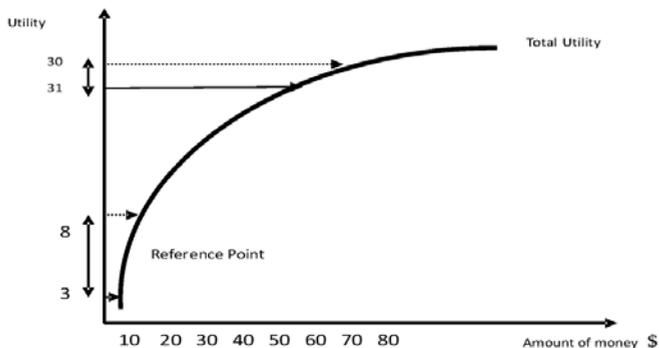
Modern Finance is the paradigm that has guided academics' way of thinking in Finance since the 1950s. Traditionally, economists have shaped their behavior according to rational decision makers who use all available information. According to traditional finance, the investor is "homo economicus", a Rational Economic Individual, selfish and with full access to information. As soon as the new information is available, the individual applies the Bayesian formula to update his opinion of future events probabilities. Of course, "homo economicus" operates within imposed limitation of his budget.

The traditional finance perspective is based on the Traditional Decision Making theory, which assumes that people are rational and that they value the full range of potential results of their decision-making. The result that gives the maximum of the expected benefit is the optimal one. According to the theory of rational choice, when people are faced with different choices in conditions of insecurity, they will choose the alternative that maximizes their individual satisfaction. This theory assumes that people, due to their preferences and limitations, are able to make rational decisions by effectively evaluating the costs and benefits of every available option. The final decision will be the best solution for the individual. A rational person has self-control and is fearless of the emotions and external factors and, consequently, knows what is best for himself. These rational people are presumed to be averse to risk, who should be rewarded for their extra risk taking decisions. These assumptions have contributed as a basis for building important theories and models in finance such as CAPM Model or Modern Portfolio Theory. People are often forced to make decisions under uncertainty circumstances, which complicates the decision-making process. It is difficult to predict every possible outcome or to estimate the probability for every outcome. The theory assumes that people know what they want, their preferences are stable, and they are selfish in the choices they make. The Standard Finance approach is based on a set of assumptions that simplify reality. Standard Finance is defined by rules that show how investors should behave and not how they actually behave.

- Some features of the basic assumptions of Traditional Finance are summarized below:
- Participating actors are logical, independent agents, characterized by maximizing utility, risk aversion, rational expectations, and Bayesian supporters, thus assessing the probability of an event based on their knowledge of similar events.
  - Perfect markets are unstable and competitive. - In balance, all participants reach their optimum. Their investment portfolios are efficient and have average variation.
  - Only systematic risk is assessable.
  - No experiments are used in traditional finance studies.
  - Logic has priority over data.
  - It bases on logical deductive methods that take on the normative axioms.

### The Theory of Expected Utility

Traditional finance is a normative approach, which means how rational individuals will invest in maximizing the benefit, which is "the level of relative satisfaction received by consuming a good or service." The Theory of Expected Utility developed by Morgenstern and von Neumann in their book "Theory of Game and Financial Behavior" in 1944, originated in the 18th century by Daniel Bernoulli, Levin (2006). It was intended to explain rational choices made in risky situations, based on the assumption that people prefer more to less, as well as on sustainability of preferences. The chart below shows a concave feature of Utility through a curved sloping line. The wealth level is shown on the horizontal axis and the Utility in the vertical one. As we can see, utility grows with wealth growth, but the growth rate is decreasing, which means that for the same increase in wealth, an individual gets less pleasure if he is richer than a less rich individual, so the marginal utility is downward. The marginal utility to any given fortune level is simply the slope of the utility function at that level of fortune. Determining the utility for each result and giving a weight as the probability of the result, the expected utility is calculated, where among all the results, the rational individual will choose the result with the highest expected utility.



Graph 1.1 Traditional Finance view: Utility function for a Risk Averse Investor

Source: Ricciardi and Baker - Investor Behavior

*Risk Aversion:* One of the basic principles in finance is that the investor's required return increases with risk, i.e. investors are supposed to be risk averse. The Utility

Function suggests in its own terms, a contradiction to risk. The risk premium is the amount of asset from which an investor is willing to give up, in order to avoid an uncertain outcome. If the risk is present, the risk premium should be positive, otherwise investors would refuse to hold the asset.

### Modern Portfolio Theory

Traditional finance focuses on quantitative risk measurement. The essence of this approach is macro-level risk assessment, including all investors within financial markets. The main theory of traditional finance is the modern theory of the portfolio. This theory claims that rational investors apply *diversification* to optimize their portfolios and provide an approach to evaluate a risk asset in this portfolio with the Capital Asset Pricing Model (CAPM) model. A basic condition of the theory is the existence of a positive relationship between risk and return. In 1990, Harry Markowitz won the Nobel Prize in Economics for the Development of Modern Portfolio Theory, which he introduced for the first time in 1952. The theory is a mathematical structure of asset portfolio distribution in order to maximize the average return for a given risk level. The basic idea is that the return and the risk of an asset should not be evaluated separately, but it should be noticed how they affect the risk and return of the entire portfolio. While the average return on a combination of securities in a portfolio is the average of the amount of each particular return, the portfolio risk is different. It depends on the correlation between the assets: if they are positively correlated, their combination in a portfolio would not bring any downward risk to the portfolio; if they are not positively correlated, the good performance of an asset would be balanced by the better performance of another asset, contributing to the portfolio risk reduction as a result of diversification. The goal is to create a portfolio that can generate a maximum return on a given risk level. Investors who don't tolerate risk will invest in a larger amount of risky or less risky assets, while those who are more tolerant will invest lesser in non-risky assets and more in risky assets. The risk of an asset, should not be evaluated as isolated, but based on the contribution it gives to the portfolio's risk. Some sort of risks are diversified, non-systematic and can be eliminated, others are stable, systematic, affect the entire market and its players, and cannot be reduced by any combination of the assets in the portfolio.

#### CAPM

The capital asset pricing model enables the measurement of the risk of the financial asset, called beta,  $\beta$ . CAPM measures the relation between the ups and downs in stock prices and the instability of the overall stock market. Beta measures the market's risk, in which the higher the beta is, the more sensitive the expected return on stock is to changes in overall market returns. Beta measures how significant are the return of the financial asset towards the market and are different for any form of asset.  $\beta$  of a risk-free asset is 0, while  $\beta$  of the market is 1. In 1990, the Nobel laureate in Economics was William Sharpe for his work in studying the risk-return correlation. In 1964, Sharpe first introduced the CAPM model through the following equation:

$$E(R_i) = R_f + \beta_i (E(R_m) - R_f)$$

Where:

$R_f$  - return rate for the risk-free asset,  
 $E(R_m)$  - expected rate of return on the market  
 $\beta_i$  - systematic risk for financial asset  
 $E(R_m) - R_f$  - premium market risk

Risk premium must be positive, otherwise no investor would invest in risky assets. The expected return of the asset varies on the asset's  $\beta$  changes, a  $\beta$  increase (risk), would result in an increased expected return rate for the asset in which is invested.

### Efficient Market Hypothesis

*"I don't think there is any other hypothesis in the economy that has more empirical evidence in support of it than the Efficient Market Hypothesis."* - MC Jensen (1978)

This hypothesis was developed in the early 60's by Professor Eugene Fama of the University of Chicago. The CAPM model introduced building models that investors used to rate the asset's price, seeking to identify undervalued assets. In 1953, before introducing the CAPM model, Maurice Kendall presented facts about determining the price of securities, which did not find support in academic finance circles. According to him, "past price information is not used to predict future prices". Future price changes are unpredictable because prices do not follow regular movements. According to the efficient market hypothesis, financial markets are efficient, investors make rational decisions, market participants are sophisticated, informed and operate only based on available information. Since everyone has the same access to this information, all financial assets are valued in the right way. No market participant will have the advantage of predicting stock prices because everyone holds the same information.

*Theoretical Principles of the Effective Market Hypothesis*– There are three essential arguments of the Effective Market Hypothesis: Investors are supposed to be rational and rationally evaluate securities; according to the degree of rational absence of certain investors, their trading decisions are random and eliminates each other without affecting the prices; if investors are irrationally correlated, rational arbitrators will eliminate the impact on prices.

*Some assumptions of the Effective Market Hypothesis*: Rational investors react to news by offering more or less according to what they perceive is good or bad news; the prices respond immediately to the news; Prices include all available information within them; nobody earns higher returns for a certain level of risk.

If we count the fact that investors are non-correlated (random) in their trading, they will be eliminated between them at an aggregate level, it will be created a higher trading volume (capacity) and there won't be any significant impact on the market's prices. On the other hand, if investors attempt irrationality, the arbitration panel will see opportunities to realize low-risk or risk-free benefits; they will become the other party in irrational trading and will cause losses for irrational traders or they will remove irrational traders from the market and will reestablish the price to its fundamental value.

Fama (1970) points out three forms of the Effective Market Hypothesis in order to make clear the meaning of "all the information".

*Weak Efficiency Forms* – Traded assets prices reflect all past information publicly available to investors. So, the technical analysis of past data on prices will not be fruitful.

*Semi-solid Form of Efficiency* - Traded asset prices also reflect all the information publicly available, as well as the fact that prices change immediately to reflect this new information. Investors cannot make abnormal returns using information that are released as statements or media reports about company profits.

*Strong Form of Efficiency* - The prices of traded assets immediately reflect private, hidden, internal information. So neither the "interior" of society can create strategies that can generate "abnormal" returns.

The following is a summary of their main authors and theories in traditional finance field:

Author	Year	Findings
Mill	1844	Homo economicus concept
Bernoulli	1738, 1954	Expected Benefit Theory
Neumann and Morgenstern	1944	Expected Benefit Theory
Markowitz	1952	Markowitz's Portfolio Theory
Treynor, Sharpe, Lintner	1962, 1964, 1965	CAPM model
Fama	1970	Efficient Market Hypothesis
Black, Scholes, Merton	1973	Teoria e vlerësimit të opsioneve

Table 1.1 Traditional Theories in Finance

Source: Prosad, Kapoor, Sengupta, 2015

## An Overview of Behavioral Finance Theories

*"The market may remain irrational longer than anyone can stay in a state of solvency."*  
 Keynes

In an ideal world, people would always make optimal choices that would provide them the highest profits and pleasure but there are many facts which prove that the assumption of the rationality of traditional finance is unrealistic. The Behavioral Finance psychology and the economy exploring why people sometimes make unreasonable decision and why their behavior does not follow economic model predictions. People are emotional and easily distracting, so they can make decisions that are not in their own personal interest.

Financial Behavior assumes that the information's structure and the characteristics of market's participants influence constantly in the individual investment decisions as well as the financial markets' efficiency. Regardless of the traditional finance theories, financial assets are often sold at non-justified prices, investors make irrational decisions, and they are affected by emotions or psychology behaving in unpredictable manners. This does not mean that the theories are not valid, sometimes their concepts work. According to the Efficiency Market Hypothesis, because the prices are unpredictable, there are no systematic investment models, whereas Behavioral Finance studies reveal some predictable examples in the market share. According to the Efficiency Market Hypothesis, all information is equally distributed to all market's participants,

but if this were true then *insider trading* would not exist, unexpected bankruptcies would not happen, regulatory efforts to increase the efficiency of markets as a result of lack of access to information from certain parties, would not be necessary.

Traditional models fail to provide convincing explanations for certain trends in the investor's behavior, they cannot explain current behavior, the observed one. The inability of traditional finance theories to explain behavior during the investment decision-making, generated this new field, the future of finance, Behavioural Finance. We may mention well-known Behavioral Finance researchers that are Nobel Prize winners like Gary Becker, Herbert Simon, Amos Tversky, Daniel Kahneman, George Akerlof, Eugene Fama, Robert Shiller, Richard Thaler etc. As well as the Standard Finance, the Behavioral one relies on some basic assumptions, but while the Standard's assumptions are based on the ideal financial behavior, the Behavioral Finance assumptions refer to the observed financial behavior. Some features of the basic assumptions are summarized below:

- Do not think market players are rational or markets are efficient.
- Suggests that the institutional environment is profoundly important.
- Everything originates is "Bounded Rationality".
- The research methods are mainly inductive.
- The core of its study consists in the experimental research and the individual's behavior observation.

### **Theory of Decision-Making Behavior and Bounded Rationality Theory**

The Theory of Behavior in Decision-Making includes models of decision-making and data on people's real behavior. People make choices which satisfy their most important needs, but that does not mean that this is the optimal choice (Simon, 1955). The discovery of a long list of psychological tendencies that influence judgment and lack of mental excellence led to the need for alternative theories of the expected returns. Supporters of Behavioral Finance don't think that people are irrational when they don't behave according to the expected *utility* expectations, according to them people want to make rational choices but they have limited capabilities and resources. Precisely this argument was the basis for the Theory of Bounded Rationality developed by Simon's (1978), which served as the basis for a good part of the following decision-making theories. The theory says that optimal decision making is limited due to cognitive limitations and lack of information. If the Traditional Finance assumption that all investors make rational decisions would be true, then such phenomena, such as speculation, bubbles or excessive irrationality would not exist, and nobody would buy securities when the price would be high and then panic, sell them when the price goes down. Despite classical theories, speculation happens, bubbles are created and then they crack. Decades of research on Investment Behavior through Quantity Analysis show that irrational behavior is costing investors too much.

### **Prospect Theory and Risk Aversion**

*Allais Paradox*

A few years after Von Neumann and Morgenstern developed the Expected Utility

Theory, in 1952, the most well-known economists of the time gathered in Paris for a risk discussion. Maurice Allais, one of the key organizers of the meeting, (the next Nobel Prize winner a few years later), addressed some questions to the audience, a powerful supporter of the Classical Finance Expected Utility Theory. What would you choose in each of the following cases?

61% to win \$ 520,000 or 63% to win \$ 500,000?

98% to win \$ 520,000 or 100% to win \$ 500,000?

Most people choose the first option of A and the second option of B. Even the participants in the meeting made this choice, violating the expected Theory of Utility, without noticing it. The world's leading theorists in the decision-making study, supporters of Expected Return Theory, manifested preferences that conflicted their view on rationality!!! Allais' paradox stimulated the development of a theory that would describe people's choices, which was the Theory of Prospect.

### *Prospect Theory*

It is considered the most acceptable alternative to the Expected Utility Theory. Daniel Kahneman, Amos Tversky, Paul Slovic, were psychologists who created a cognitive basis for common human errors that arise from heuristics and biases (Kahneman & Tversky, 1973, Kahneman, Slovic & Tversky, 1982, Tversky & Kahneman, 1974), and developed the Prospect Theory (Kahneman & Tversky, 1979). In 2002, Kahneman won the Nobel Prize in Economic Sciences. His empirical discoveries challenged the assumption of human rationality ruling the modern economic theory. One of the differences between the Prospect Theory and the Expected Utility Theory, is that the second is a normative model which describes how people should behave, while Prospect Theory is based on current behavior. People often make inconsistent choices and this statement is clearly illustrated in the problem below.

### *Exercise 1*

You deal with a couple of decisions: 1 and 2. Which alternative do you prefer, in each of the decisions?

1. Choose between A (sure win 24,000 L) and B (25% chance to win 100,000 L and 75% to win nothing).

2. Choose between C (sure loss of 75,000 L) and D (75% chance of losing 100,000 L and 25% to lose anything).

Which alternative did you choose? Like you, the majority of people choose option A for decision 1, and option D for the second decision. This example of behavior does not match the Expected Utility Theory, because choosing option A for decision 1 indicates risk contradiction, while choosing Option D for decision 2 indicates risk acceptance, indicating instability of people's preferences to risk.

*In decision 1: expected value of A = 24,000 L (sure)*

*expected value of B = 25% \* 100,000 L + 75% \* 0 = 25,000 L (risky)*

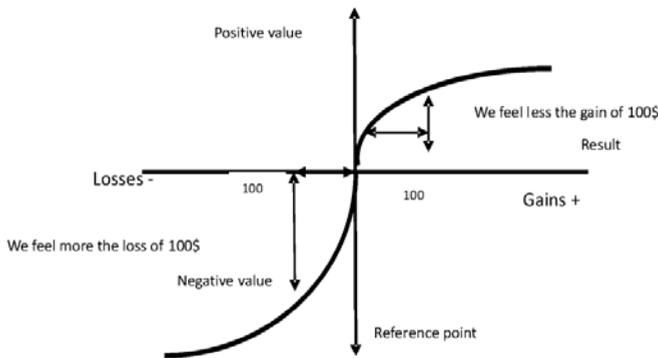
People choose the expected low returns alternative because it is sure, so they are risk averse.

*In decision 2: expected value of C = 75,000 L (sure)*

*expected value of D = 75% \* 100,000 L + 25% \* 0 = 75,000 (risky)*

People choose option D (although they have same expected returns) because it is uncertain, so they are risk seeking.

A rational risk-averse investor would choose A and C, and if it were a risk seeking, would choose B and D. The expected utility cannot explain why a decision-maker changes his preferences, whereas in Prospect Theory, this behavior is one of its basic rules. The graph below presents the Prospect Theory value function. The theory claims that people maximize the value, not the expected utility. Another important aspect of the theory is that people evaluate the results based on their fortune alteration and not on the basis of the ultimate fortune position. The horizontal axis shows the change of wealth starting from a reference point, while the vertical axis indicates the value, which is the assessment of a similar outcome to the utility. The person's initial wealth position serves as a reference point. The value function is convex in loss square, but concave in the gains square. This shows that people behave as risk seeking in situations where the decisions have to do with loss (Alternative D of Decision 2 in the example above) and as risk averse in situations where the decisions have to do with gains (Alternative A of Decision 1).



Graph 1.2 The Behavioral Economics Perspective: The Role of Prospect Theory for a Risk Averse

Source: Kahneman and Tversky 1979

Prospect theory can be used to explain many irrational financial behaviors. For example, there are people who do not want to put their money in bank to earn interest or who refuse to work long hours because they don't want to pay more taxes. Although these people would benefit financially from additional tax revenues, the Prospect Theory suggests that the benefit from additional money is not enough to overcome the sense of loss caused by tax payments.

A further aspect of the Prospect Theory seems to appear from the Utility Asset function. When people make decisions, they reflect a strong opposition to loss, which next will refer to it as an *Opposition to Loss*. As we can see from the graph, the anxiety caused by the loss of a certain amount of money, is a more painful experience than the satisfaction caused by the acquisition of the same amount. According to Daniel Kahneman in his book *Thinking Fast and Slow* (2011 edition, p. 284), "losses weigh more than profits".

So there are three features that distinguish this function from the expected utility one:

The value is measured in terms of wealth position change, starting from an initial reference spot. The value function is convex for losses (risk taker), but concave for gains (risk averser). The value function slopes more in losses than in gains due to the opposition to risk. People will choose the option which gives maximum expected value, the same procedure of the theory of Expected Utility, but in which the alternative that gives maximum expected utility is chosen.

### **Framing the problem**

Kahneman and Tversky (1979) also supported their theory development on the idea that people do not make the same choices when these choices are presented in multiple ways. One of the terms of the Theory of Expected Utility is that people's preferences are consistent. The problem of the case presentation / framing has to do with how decision-maker perceives the problem. An example known by Tversky and Kahneman (1981):

Problem 3: Imagine the country is preparing for an epidemic outbreak that is expected to kill 600 people. Two alternative programs are proposed to defying the disease, the consequences of which are measured as the followings:

*If program A is executed, 200 lives will survive. If program B is executed, there will be 1/3 probability that 600 people will survive and 2/3 probability that no one will survive. Which of the programs do you prefer?*

*The same problem is displayed to another group but with different measures:*

*If program C will be executed, 400 people will die.*

*If program D will be executed, there will be 1/3 probability of no one dying and a probability of 2/3 that 600 people will die. Which of this programs would you prefer?*

Most of the participants in Kahneman and Tversky study, chose A in the first case and D in the second case. According to the Prospect Theory, the answers implicate that when the problem lays in terms of benefits, the majority are risk averse, whereas when the problem lays in terms of losses, the majority are risk receivers. According to the Traditional Finance point of view (expected utility theory), a rational economic decision maker would choose A and C if it were a risk averse, and B and D if it were a risk taker because the results of A and C are the same, as well as B and D. Even when the participants were a group of public health professionals, the "framework" effect did not spare them, which means that even the people who have the power to make decisions affecting the health of all people, may be influenced by superficial manipulations. The investor's perception on decision may change by manipulating the information presentation form, different presentations cause a preference subversion for the same objective results. The Behavioral Finance theory has an effect even in different countries policies. Richard Thaler, winner of the Nobel Prize in Economics in 2017, a senior colleague of various scholars in the Financial Behavior area, in his book *Nudge*, gives instruction on how to apply the principles of Behavior Finance in public policies provided by Obama's administration. According to an article published in 2003, it was stressed out that the organ donation rate in Austria was almost 100%, while in Germany only 12%; in Sweden 86%, but only 4% in Denmark. These great changes for very similar countries are caused by the way the question is presented; the "frame" effect has played its role. In those countries that have high donation rates, people are given a questionnaire to fill in and those who do not want

to donate their organs must mark a cross in the adjacent box. If they fail to do so, then they are considered donors with their free will. In low donation rate countries, you need to mark a cross in the box to become an organ donor. These countries recognize the effect of phrasing the question and they use the formulation that best expresses their social policy on this issue.

### **Heuristic**

The study of heuristics in human decision-making was developed in the 70s and 80s by psychologists Amos Tversky and Daniel Kahneman, while the concept was first introduced by Nobel winner Herbert A. Simon. Heuristics is used to reduce mental efforts in decision making, but it can lead to systemic psychological tendencies or mistakes in the judgmental process. When making decisions or judgments, we often use shortcut mental methods known as heuristics. In the decision-making process we may not have the time or resources to compare all the information before we make a choice so we use heuristics to help us make quicker and more efficient decisions. Sometimes these shortcut mental methods can be useful but in other cases they can lead in cognitive or prejudices mistakes (psychological tendencies). Under given circumstances, the human brain thinks in two different ways. Keith Stanovich and Richard West have used for the first time respectively the terms System 1 and System 2, terms that are used frequently in psychology. System 1 operates automatically, fast, without getting tired or strained, without voluntary control, creating first impressions and feelings that are used as a source for the beliefs and intentional choices of System 2. System 2 emphasizes the psychological activities, such as difficult calculations, is conscious, rationalizes, decides what to do, provides self-control, and controls the impulses of the System 1. System 1 contains innate abilities (perception of the world around us, knowledge of objects, orientation of concentration, loss avoidance, fear, etc.), but also fast and automatic psychological activities taught by repeated practice. Impressions and impulses are created by System 1, and if they are supported by System 2, they are transformed into voluntary beliefs and actions. When System 1 is in difficulty and cannot answer a question, then System 2 takes action.

Heuristics is the approach to problem solving that includes practical methods which do not guarantee to be optimal but are sufficient to speed up the process of a satisfactory and suitable solution. Heuristics includes rapid psychological actions that facilitate the human mental load, simple, efficient rules learned in processes that help explain how people make decisions, judge or solve problems when faced with complicated situations or lack of information. In 2002, Daniel Kahneman and Shane Frederick proposed that heuristics work according to a process called the attribute substitution that happens unconsciously. If you cannot find a satisfactory answer to a difficult question, System 1 will find an easier question and answer it. The simplest question is called the *heuristic question* whereas answering a question with another question, is called *substitute*. The last one served as a basis for what later was called the *Heuristics Approach and Psychological Tendencies*. In this perspective, heuristics is often vulnerable to mistakes in situations that require logical analysis. System 1 operates correctly in familiar situations or short-term predictions, but in certain situations is willing to perform systematic errors known as *Tendencies*. System 1 comprehends very

little of logic and statistics, and works all the time. Because it works automatically and cannot stop working, it is difficult to prevent intuitive thought mistakes. Tendencies cannot always be avoided because System 2 may not "catch" the mistake, it must be constantly vigilant to do so, which is not practical. What can be done is to learn to recognize the most frequent misplaced situations and to try to avoid major mistakes that can lead to major consequences (*Thinking Fast and Slow* p28). The experiment developed by the problem below, by D. Kahneman, best illustrates the theory above: *A ball and a bat cost \$1.1. The stick costs \$1 more than the ball. How much does the ball cost?* The intuitional answer that comes to your mind (suggested by System 1) is \$ 0.1, but it's wrong. If you do the math, the correct answer will be \$0.5. Why System 2 did not monitor System 1 suggestion? System 2 supported an intuitive response that it could have been rejected if it would had tied a little bit, the cost of controlling would have been too low: it would have taken only a few seconds of mental work. People tend to have too much faith in their intuition, they do not like mental exhaustion and they try to avoid it. Kahneman's experiment was conducted among students of the best universities in the world and more than 50% of them were wrong, meanwhile in not so good universities this rate was more than 80%, but the problem was soeasy anyone could solve it. Such cases, but also others, show that there is lack of motivation or effort, because System 2 of these people is "lazy". The few who responded correctly are more alert, intellectually more active, and they tend not to be satisfied with seemingly appealing answers, more skeptical towards their intuition, more rational (Keith Stanovich, 19). In the following table we present a summary of key literature findings and theories of Behavioral Economics field

Researcher's Name	Year	Concept
Simon	1955	Bounded Rationality
Festinger, Riecken and Schachter	1956	Cognitive Dissonance Theory
Tversky and Kahneman	1973,1974	Introduced heuristics tendencies: availability, representativeness and anchoring
Kahneman dhe Tversky	1979	Prospect Theory: Introduced risk averse
Tversky dhe Kahneman	1981	Introduced the tendency of framing a problem
Thaler	1985	Introduced the tendency of mental accounting
De Bondt and Thaler	1985	The theory of stock market overreaction
Barberis, Shleifer and Vishny	1998	A model of investor sentiment on under/overreaction on stock prizes
Statman	1999	Capital asset pricing model and Behavioral portfolio theory
Shleifer	2000	Stocks' market are not efficient
Barberis, Huang and Santos	2001	Prospect theory on asset prizes
Grinblatt and Keloharju	2001	Behavior's role on trade marketing
Fromlet	2001	The evolution from homoeconomicus or traditional paradigm to the realistic one
Barberis and Thaler	2003	A survey on Behavioral Finance
Coval and Shumway	2006	Psychological effects on stock prizes

Table1.3 Concepts of Behavioral Finance

Source: Prosad, Kapoor, Sengupta, 2015

## Conclusions

Behavioral Finance has been developing rapidly in the last 30 years. Although the concept of "Behavioral Finance" appeared for the first time around the 90-ies in scientific and daily journals (Ricciardi and Simon 2000), its foundations can be found too early in the history of finance since the years 1600 (MacKay, 1841). Behavioral Finance tries to explain investor decisions by combining knowledge of psychology and finance at micro but also at the macro level. (Investor Behavior, 2014, pg. 7). Some famous scholars in the field of Behavioral Finance are Nobel Prize winners in Economics such as Simon (1978), Becker (1992), Kahneman (2002), Fama (2013), Shiller (2013), Thaler (2017). The most famous classic theories in finance such as Efficiency Markets, Modern Portfolio Theory, CAPM Model, Expected Benefits Theory, assume that the investor is rational, elaborates all available information and intends to maximize the expected benefit. Researchers have noticed many cases of market inefficiencies, (Johnson et al., 2002), further reinforcing the belief that people can not behave rationally in investment decisions (Shephing, 2000; Shleifer, 2000; Taleb 2004).

Events like the tulip mania in the Netherlands or bubbles and the global crisis throughout history raise the question: are investors really rational? This question has been raised by various scholars in the past and relates to the dilemma that investor behavior does not coincide with traditional financial theories. The presence of market anomalies proves that the process of making financial decisions is not just about rational, cold and calculating people. In this way, the need to understand the abnormalities and shortcomings of human judgment has become the forerunner of financial behavior, a field which is thought to be the future of Finance.

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