

Reading Project  
MVE220 Financial Risk  
Behavioral Finance



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**CHALMERS**

## Aim

The aim of this report is to give a short introduction to behavioral finance including a brief discussion about the origin of behavioral finance, important concepts and some practical applications.

## Background

When we talk about “conventional” finance, we often refer to the theories and ideas based on logic and rationality. For example we have theories such as *the capital asset pricing model* and *the efficient market hypothesis*. Both of these well known theories require that people most often are predictable and have a rational behavior.

For a while, such theories did a pleasant job describing financial events and incidents. However, eventually academics in finance and economics started to realize that these ideas were not enough to explain certain financial events that occurred. Such events are called *anomalies*, and they violate the modern financial and economic theories (Phung, 2017).

A common expression in finance is *Homo Economicus*, the idea that people are rational “wealth-maximizers”. According to the conventional financial theories people always act according to this; to increase their own well-being and wealth and never let emotions affect their economical choices (Phung, 2017).

As one may understand, the real world doesn’t really work like this. It is clear that people are often irrational and frequently make decisions that doesn’t reflect the ideas of the Homo Economicus. Because of this, academics started to look into cognitive psychology in hopes of finding the answers that conventional theories failed to give. This is today referred to as *behavioral finance*. While conventional theories strive to account for the actions of the Homo Economicus, behavioral finance seeks to explain the way we actually act (Phung, 2017).

Although many people have contributed to this field, there are some major influencers whose work has had a big impact for the evolution of behavioral finance. To start with, we have the cognitive psychologists Daniel Kahneman and Amos Tversky who are referred to as the fathers of behavioral finance. Since the beginning of their collaboration in the late 1960s they have published around 200 works, and their main focus are the cognitive biases and problem solving methods that cause people to behave irrationally. Their most popular writings handles the topics prospect theory and loss aversion. Kahneman also received the Nobel Memorial Prize in Economic Sciences 2002, for his contributions to the field of irrationality in economics (Phung, 2017).

Furthermore, another big name associated with behavioral finance is the economist Richard Thaler. While Thaler studied, he noticed more and more of the inadequacies of the conventional theories. After reading Kahneman and Tversky's work on prospect theory, he realized that psychology could be used to explain people’s irrational behavior. Thaler started to collaborate with Kahneman and Tversky, incorporating psychology with finance and presenting concept such as mental accounting (Phung, 2017).

## Central Theories

To understand the concept of behavioral finance there are some theories that are quite crucial to get familiar with. First of, Daniel Kahneman and Amos Tversky are two of the pioneers in behavioral finance, and among their studies the *prospect theory* is maybe the most well acknowledged within the field of behavioral finance.

### Prospect Theory

According to the prospect theory there is a *value function* which describes how people tend to think of risk. Daniel Kahneman and Amos Tversky suggest that there is a significant difference in how we approach gains versus losses. For example, if a person is given \$20 and another person is first given \$40 but then \$20 is removed, the second person will be less happy. This is clearly irrational because they both earn the same amount of money, but can be explained by the fact that a loss amount is mentally “worth more” than a gain of the same value. This approach to decision making is different from that in the conventional theory which implies that decision making is done entirely on the basis of the total wealth, and not on the change in wealth as Kahneman and Tversky suggest (Thinking Fast and Slow, 2011).

Origin in the value function is known as the *reference point* in Kahneman and Tversky’s theories, and is usually the point which refers to today's wealth. But, the reference point is also very much a psychological state and by manipulating people it can be seen as something very different than the actual wealth. This kind of manipulation is called *framing*, that is, suggesting a different reference point (Schiller, 2012).

The dissymmetry of the losses curve and gains curve in the value function demonstrates what is known as *risk aversion*, which can be described as the fact that people in average try to avoid losses more than they are seeking gains (Thinking Fast and Slow, 2011).

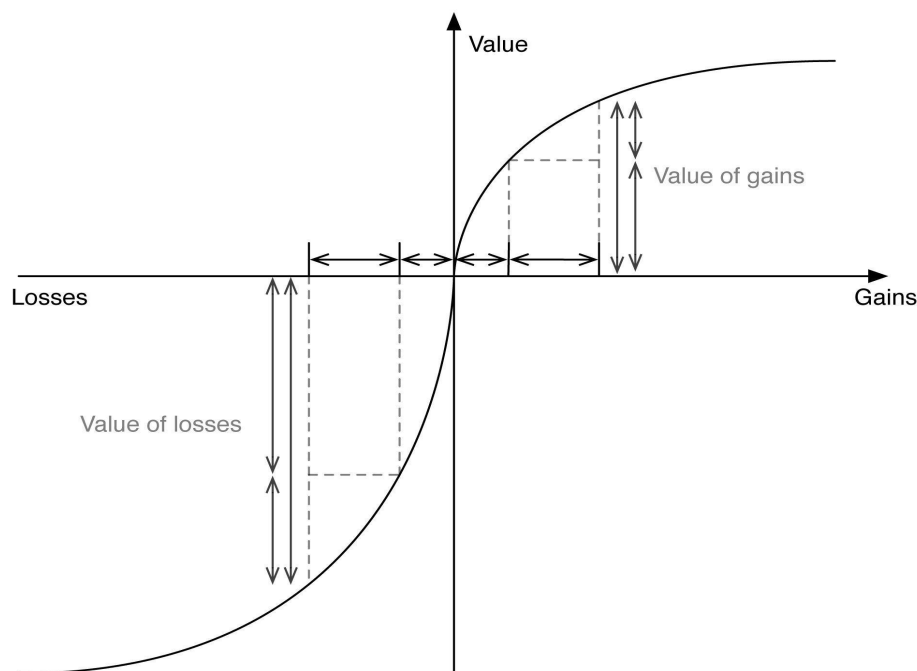


Figure 1: Kahneman & Tversky (2000)

## Weighting Function

In addition to the value function Kahneman and Tversky are the originators of the probability *weighting function*, shown in Figure 2 below. This graph represents how people in average are failing to acknowledge the linearity of probability and tend to underestimate the probability of unlikely events as well as overestimating the probability of very likely events. Professor Robert Schiller at Yale university states that people sometimes think of probability as three states, namely unlikely, may happen and likely. This causes tendency to make strange decisions, either by overestimating or by underestimating the likelihood (Schiller, 2012).

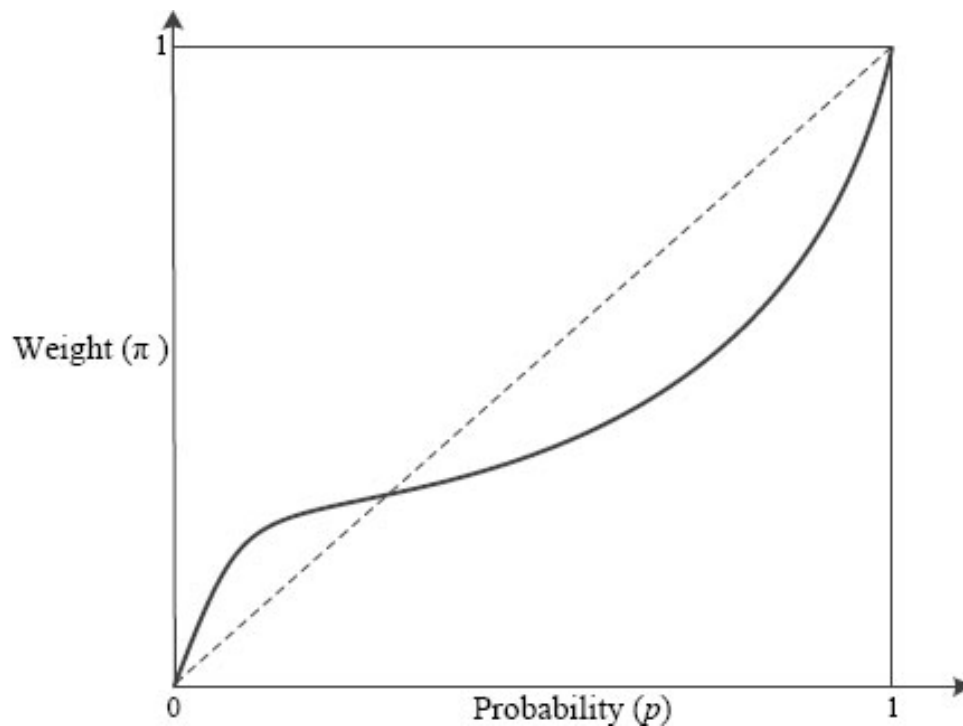


Figure 2: Kahneman & Tversky (1992)

## Regret Theory

*Regret theory* is the theory that says that people tend to act in fear of their future regret. This affects how decisions are made and can result in both risk aversion and risk seeking behaviour (Investopedia, 2017).

## Mental Accounting

*Mental accounting* is another irrational way to approach economic decision making. By dividing money into different categories, i.e savings and bonuses, we treat money in different categories differently. This causes situations where one might think that one is saving money, but in fact more money are spent than saved (Sanlam Investments, 2016).

## Overconfidence

Researcher James Montier found in a study from 2006 that, among the 300 professional fund managers that had done the survey, 74% believed that their job performance was above average. If one is familiar with statistics, this result is clearly irrational due to the fact that only 50% of a sample can be above average. This phenomenon is called overconfidence and refers to cases of when people are overestimating or exaggerating one's ability or performance. This of course does not only occur in finance, but in life overall. When it comes to finance though, it seems that people that are

overconfident tend to believe they are better than others at choosing the best stocks and best times to enter or exit a position. They also tend to perform more trades than their non-overconfident counterparts. Overall overconfidence yields lower returns than the market and can be a very risky approach and big losses (Phung, 2017).

### Gambler's Fallacy

Another irrational financial behavior is the *gambler's fallacy*. This refers to the illogical thought of that a certain random event is less likely to happen again if it has already happened. This is irrational due to the fact that past random events do not change the probability that future events occurs. In finance a lot of traders tend to fall prey to this. For example, just because a stock has gone up on the last three trading sessions it does not imply that it is less likely to go up on during the next session. Traders often think the stock is less likely to go up in this scenario, leading to irrational trading decisions (Phung, 2017).

### Cognitive Dissonance

Leon Festinger describes what he calls *cognitive dissonance*. The term cognitive dissonance tries to explain how come people do things which they know to be bad or somehow not in correlation with their perception of their ego. Leon Festinger claims that there are two ways to approach such a scenario, one could simply change the behavior, or, change the way one thinks about it. The latter leads to an over exaggeration of evidence that the action or belief is correct and pushing away evidence of the contrary. In that way, the action or the belief is justified, and facts pointing to the opposite simply won't stick (Festinger,1957). This is what is called *confirmation bias* (Schiller, 2012).

### Anchoring

When we on the other hand don't have a clue of what we "should" think or believe, the term *anchoring* is interesting. Professor Schiller refers to an experiment including a wheel of fortune, this experiment was carried out by Kahneman and Tversky. The thesis is that when we don't have a clue of a reasonable number or answer to a certain question we sometimes make up random patterns. The study by Schiller refers to states that when a group of people were asked a question they did not know the answer of after they had seen a wheel of fortune spin they were very likely to answer the question with a number close to the one the fortune wheel stopped at. This shows how people in general have tendencies to be fooled by random impacts when making decisions (Schiller, 2012).

### Herd Behavior

We are not only impacted by randomness, but we are also impacted by the social context which we act in. The French psychologist Emile Durkheim talked about collective consciousness during the beginning of the 19th century. Another word used to describe this is the German word *zeitgeist* that somehow refers to our shared beliefs, or spirits, of the time. The *herd behavior* is also a term referring to the same kind of *social contagion*, that is how people are more influenced by the context in which they act than they believe themselves to be (Schiller, 2012).

## Behavioral finance in practice

Traditional economic models assume that all people are rational and have access to perfect information. However, this is usually not the case. People are most often biased, something which Daniel Kahneman describes as a cognitive illusion (Benartzi, 2011). For instance, we tend to unconsciously link the price of a product to quality. A study let participants taste test wines. They gave the participants fake prices and scanned their brains to measure their level of enjoyment. The results of the study showed that there was a high correlation between price and perceived quality, and that participants enjoyed the wine more if they thought the price was high. This held true even when they were served the same wine, but was told it was differently priced (CrashCourse, 2016). Another example of a cognitive illusion is the phrasing of an offer. People are more inclined to choose the “90 % fat-free yoghurt” than the “yoghurt with 10 % fat”, even though the options are logically equal (Benartzi, 2011).

This is also true in finance. Per traditional economic theory assets are bought at, or at least near, their real value. However, De Bondt and Thaler (1985) showed that investors tend to overreact to new information and data. They studied historic returns on the New York stock exchange and separated the stocks into two different portfolios: the “winners” portfolio with the 35 best performing stocks and the “losers” portfolio with the 35 worst performing stocks. These two portfolios were tracked for three years and compared to a market index. The results were quite surprising. The losers portfolio clearly beat the winners portfolio with an almost 25 per cent’s difference. Furthermore, the losers portfolio performed better than the index whereas the winner's portfolio underperformed. The results were somewhat of a role reversal; the winners had become losers and vice versa (De Bondt & Thaler, 1984).

An explanation to this result was that the market had overreacted. Investors had overreacted to bad news, initially driving the stock prices down an unproportional amount for the losers portfolio. With time, investors concluded that these stocks were under-priced and these stocks rebounded. The opposite was true for the winners portfolio. This result held true for up to five years after portfolio formation (De Bondt & Thaler, 1984).

Another example of behavioral finance in practice is the prospect theory developed by Daniel Kahneman and Amos Tversky. Per traditional models people always avoid risk, but Kahneman and Tversky showed that this may not be true in practice. When presented with the choice of a sure gain of \$24,000 or a 25 % chance of gaining \$100,000 and 75 % chance of gaining nothing, people seemed to prefer the former. This result is consistent with risk aversion, even though the expected gain in the second option is greater the risk is also greater. However, when instead presented with the choice of a sure loss of \$75,000 or a 75 % chance of losing \$100,000 and a 25 % chance of losing nothing people tended to prefer the latter choice, which is also the riskiest. One of their conclusions was that the risk aversion only holds when there is a possibility of gains. On the contrary, when losses are involved it is more common to choose the riskier option if that option presents the possibility of a smaller loss (Shefrin & Statman, 2003).

This aspect of prospect theory was also studied by Hersh Shefrin and Meir Statman. Their conclusion was that investors “sold winners too early and rode losers too long”, meaning that to avoid risk when there was a possibility of gain, assets are sold at an earlier time than optimal. In contrast, investors tend to hold on to bad assets for longer than optimal to avoid a sure loss. This is called the disposition

effect. It was also shown that investors tend to realize gains more frequently than losses. This holds true for all months except for in December, when the opposite occurs. This is because in December the tax benefits from losses become more prominent and thus it is more clear how the investor could somewhat benefit from a loss (Shefrin & Statman, 2003).

## Conclusions

There are clearly many ways that our irrational thinking affects our financial choices, and sometimes leads to unfortunate events such as big losses and bad trading decisions. But what can be done to minimize the risk of such events?

The fact that the concepts and theories in the field of behavioral finance exists is clearly one step in the right direction. Today most people understand that the conventional economic theories can be questioned and that we sometimes act irrationally, but people still keep making poor decisions. This often comes from, as mentioned in the text, psychological phenomenons that may be hard to avoid. Although it is easy to act on this irrational behavior, it is important to always keep them in mind when it comes to making financial decisions to minimize risk. The first step to accomplish this is to have knowledge about behavioral finance (as well as other theories), so that one can get insight and understand one's actions. Then it is much easier to have an objective perspective and question oneself. For example, if a trader that knows about the gambler's fallacy sees that a stock has gone up the last few days, he or she will know that the probability that the stock will go up is unaffected. It is random and can as well keep going up. By knowing this, one avoid decision making based on irrationality. Another example is if one knows about confirmation bias. Then one can make sure to be objective when it comes to making financial decisions, and not only listening to what "one would like to hear". By this, unnecessary misjudgement could be avoided.

Besides from keeping oneself informed to avoid risk, it is also important to always question and develop economical theories and keep doing research. By this, maybe one day in the future there will be theories with very few deficiencies that could be used to minimize risk.



## Suggested Reading

Thinking Fast and Slow (2011) by Daniel Kahneman is a book which describes many aspects of behavioral finance and is easy to follow. Kahneman is a psychologist and his perspective is therefore not very mathematical.

Daniel Kahneman and Amos Tversky are, as previously mentioned, two of the leading researchers on behavioral finance. They have published several articles on the topic, including *Prospect Theory: An Analysis of Decision Making Under Risk* (1979) and *On the Psychology of Prediction* (1973).

The website Investopedia gives a twelve-step introduction to the topic behavioral finance, as well as explanations and examples of some of the most central concepts in the field, written by Albert Phung. It is written casually and is very easy to follow. Great reading if you want to get an overview of the field. Link here: [http://www.investopedia.com/university/behavioral\\_finance/](http://www.investopedia.com/university/behavioral_finance/)

The YouTube-account YaleCourses has published a YouTube video of a recorded lecture with Professor Robert Schiller who gives a brief introduction to behavioral finance. The lecture is interesting and gives real-life applications to the described theories. Link here: <https://www.youtube.com/watch?v=chSHqogx2CI>

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