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TRADER BEHAVIORAL BIASES

In this lesson we will learn about behavioral finances through the study of Dr. Numan Ülku.

Behavioral finance is the study of financial market participants' behavior, mental processes, and psychology to understand financial market phenomena as anomalies and to understand our own behavioral biases.

Meet Dr. Numan Ülku

Dr. Ülku is a finance professor and at the same time an experienced trader in financial markets for 27 years. In his academic career, he has taught more than 700 courses on the subjects of Financial Economics, International Finance, Econometrics, Financial Markets, Financial Econometrics, etc. He has taught at many high-profile universities around the world, including Central European University, Otago and AUBG. As mentioned above, Dr. Ülku had a dual path, being both an academic and a professional operator. Besides his academic work and activities, he was involved in large projects and has a huge experience in trading.

INTRODUCTION TO BEHAVIORAL FINANCE

Our theme is financial behavior. Dr. Ülku will teach you the lesson. Behavioral finance is the study of the investors' behavior and their mental processes to understand the anomalies of the stock market and their profit behavior.

Therefore, behavioral finance represents an intersection of economic finance on the one hand and psychology on the other. It is a mixture of finance and psychology.

It serves two main purposes.

- First, to understand the behavior of the financial market, in order to clarify the anomalies of the stock market.
- And second, to help private investors avoid behavioral errors, and thus help them improve their performance.

Behavioral finance is a fairly young field. The first work that is cited as the root of the theories dates to 1979 in Daniel Kahneman's "Prospectus Theory".

By the late 1990s the field had made significant progress. We have seen many behavioral theories and empirical work on this topic.

The field of behavioral finance was officially recognized as a scientific discipline, perhaps with the award of the 2002 Nobel Prize to Daniel Kahneman.

Also, in 2013, a second award was given to this area of finance. Interestingly, the award was given at the same time as Eugene Fama, who is known as the father of efficient market theories, and Robert Shiller, who has a contrary view in favor of behavioral finance. So, in the same year the award was shared between these two academics.

Perhaps this implies that authorities consider market efficiency and inefficiency to be equal candidates to explain market behavior.

In essence, financial markets are both efficient and inefficient. They are the domain of rational theories, standard financial theories, as well as behavioral theories.

THE HISTORY OF BEHAVIORAL FINANCE

We will learn how behavioral finance emerged as a response to the failures of financial theories that explained the phenomenon of financial markets in real life, especially the anomalies.

We will cover the basic concepts of standard financial theory. And how rational standard financial theories describe the world and fail to explain some of the phenomena we observe in real life.

We will understand the concept of financial market anomalies. We will learn what anomaly means.

To understand what anomaly means, we must first see what is "Normal" according to standard financial theory. So let's start with an introduction to Standard Financial Theory.

In order to understand this introduction, some terminology is needed.

One important concept we use in finance is that of performance. In simplest terms, it is defined as the percentage change in the price of a stock.

For example, if the stock price has risen from $10 per share to $11 per share, it represents a 10% increase. So, this 10% is the yield.

The second scientific word we must learn is autocorrelation, particularly autocorrelation of performance.

Correlation is a coefficient that represents a relationship. If it is a positive number, it means that movements in value move together. And if it is a negative number, they move in opposite directions.

Autocorrelation of performance is the correlation between the performance end periods and the previous performance periods. That is today's performance and yesterday's performance.

Standard financial theory expects this autocorrelation returned to be zero. That means that, by looking at the price movements of the previous day, it should not be possible to predict today's price movements.

But in real-life financial markets, we observe statistically significant positive or negative autocorrelations. This means that by looking at yesterday's market performance, we can predict what will happen today.

Standard Financial Theory says that returns are unpredictable, we call this concept the Randomness Theory. That means that stock prices, exchange rates, bond prices move randomly in an unpredictable way.

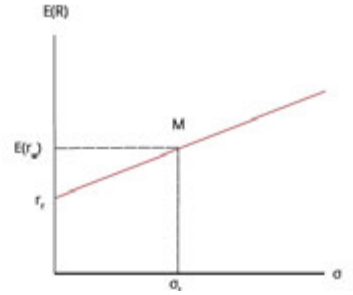
This concept is called the Theory of Efficient Markets. The Theory of Efficient Markets means that all available information, which is relevant for the valuation of financial instruments such as stocks, is already instantly reflected in the stock price. So, using that information you cannot make money in the stock market. Therefore, it should be impossible to design strategies that take advantage of that information to make profits.

Standard Financial Theory prescribes:

- On average, a stock should earn a return, which is proportional to its risk (called expected return).

By holding a stock for many periods, you will on average earn a return, which is proportional to your risk. (called expected return). So you should simply avoid trying to read the market, you should decide how much risk you want to take and you should build a portfolio, which is appropriate for your risk preference and you should buy it and hold it forever.

Standard Financial Theory predicts, that expected returns should be proportional to risk, as seen in the chart:



As we move to the right on the X-axis of this chart, we take more risks. And as you can see, the expected return, which is on the Y-axis, is increasing along with the risk. So, the more risk, the more expected return.

But for experienced real-life practitioners, this is a rather naive suggestion.

Using some of the techniques such as technical analysis, fundamental analysis, and our experience in trading strategies, it is not so difficult to read the market.

So, let's not take the standard academic advice, as it is. Let's learn the terminology used in standard financial theory!

Every stock should have a return, proportional to its risk. Therefore, this is a compensation for taking that level of risk. This is called Expected Return. The term "expected" should not confuse you, it means required return, an adequate compensation for that amount of risk.

In each period every day, a stock or other financial instrument can bring you a different return. So, the difference between the expected return and the actual return obtained is called an abnormal return.

Abnormal return = Return obtained - Expected return

$R_{i,tABN} = R_{i,t} - E(R)$

This is part of the return, which is not compensation for taking the risk, but probably comes from somewhere else. Possibly surprises from the arrival of new information, or the correction of previous wrong prices or the creation of a new wrong price due to behavioral biases.

According to the Standard Financial Theory, which we call the Efficient Market Paradigm, the abnormal return must be unpredictable.

Standard Financial Theory prescribes:

- Unexpected (abnormal) returns are unpredictable, random.

In short:

- The expected return can be predicted because it's a function of risk.
- The return obtained minus the expected return is the abnormal return and is unpredictable, according to standard financial theory.

As an academic, having worked on all these theories for many years, and as a real-life trader with 27 years of experience, Dr. Ülku claims that this argument of the Standard Financial Theory is both correct and false.

It is possible to beat the market in many cases, but you will also see that it is quite difficult when you try to do so, in many cases you can lose money.

As you may have guessed, the Standard Financial Theory proved to be wrong in many cases. That is, you cannot explain what is happening in the real world.

There are many documented statistical anomalies that we call anomalies the behavior of the stock market, which does not conform to the predictions of Standard Financial Theory but creates predictable abnormal returns and profit opportunities for investors.

Here is a list of the main anomalies observed in financial markets:

- Short-term continuity of performance (short-term trends).

In many cases the market rises for some time and then continues to rise so there are trends. And in the technical analysis we have the saying "The trend is your friend". Most traders make money by following trends. That is an undeniable truth, which the academic approaches of Standard Financial Theory cannot explain. This is the time to use our new terminology "Performance Autocorrelation". The short-term momentum that is trends means positive performance autocorrelation. Today's market movements are like those of yesterday.

- The second anomaly is just the opposite: Reversals, Negative Autocorrelation. Today's market movements are the opposite of yesterday's market movements. In the financial market we have both momentum and reversals.

To break these patterns, we have two kinds of strategies. These are the impulse strategies and the contradictory strategies.

Impulse strategies (positive mid-horizon autocorrelation in returns):

Buy most of the winners and sell (short) most of the losers of the last 3-12 months, keep for the next 3-12 months.

Jegadeesh and Titman (1993) and Rauwenhorst (1998) report about 1% average monthly gains with this strategy.

Contrary Strategies (Long-term Negative Self-Correlation):

Buy most of the losers and sell most of the winners of the last 3-5 years, keep for the next 3-5 years.

DeBondt and Thaler (1985) report significantly positive returns with this strategy.

Now, you may be curious to know how we can have both momentum and reversal in the same market. It is because they occur at different time horizons. A study by Jegadeesh and Titman in 1993 has documented evidence of the profitability of momentum strategies. If you buy winning stocks from the last 3-12 months and sell losing stocks from the last 3-12 months, and if you build this portfolio now and hold it for the next 3-12 months, you will make a profit. You will earn on the market an average of 1% per month. This is a statistically significant anomaly, which violates the predictions of the theory of efficient markets.

So, in the financial markets, especially in the stock market, both the momentum and the reversal occur in the same market, in the same stocks, but over different time horizons.

- Another interesting anomaly is the 52-week high-return strategy. George and Huang 2004 have shown that if you buy those stocks, which are now trading near their 52-week high, you will beat the market by an average of 1% per month.

And we have the most mysterious pattern, which is bubbles:

- Trends, trend reversals and the utility of technical analysis: It may be possible to make money by following trends:
- Since the 19th century, bubbles have been occurring repeatedly. Despite the catastrophic consequences for some investors, the financial community does not seem to learn any lessons in avoiding bubbles - they keep repeating the same mistake!

We call a large sustained movement a bubble, which persists for a while and then almost completely reverses itself. Although academics and the financial market community are aware of bubbles, they continue to make the same mistake, creating bubbles that then burst.

- And finally, Nobel Prize winner Robert Shiller (1981) finds that stocks are more volatile than the fundamentals require. Lo and MacKinlay (1990) discover that excessive volatility violates the path of chance.

Investors in the market add excessive volatility: too many moves in one direction followed by reversals and the opposite move in the opposite direction and then again followed by a recovery.

In reality, the fundamental value of the company does not fluctuate like this. It is much more stable. The human being is creating an artificial volatility.

As an anomaly of the stock market, we have excessive volatility in relation to fundamental values.

- And one last type of anomaly, probably the most interesting one, is the calendar anomaly. We have the Monday effect, or we have the January effect, we have the Halloween effect which means "Sell in May and walk away" until October.

In short, if you enter the stock market in October and hold your position until May, you are likely to make a positive return on average, so you may make money. But between June and September you are more likely to lose money in the stock market, which is called the Halloween effect.

This is quite mysterious; we still do not know scientifically what the real cause is. There are some hypotheses and there is some partial evidence to support this academic hypothesis, but they are still being debated.

Obviously, theories about financial behavior can be helpful here. In many cases, where Standard Financial Theory cannot explain these anomalies, Behavioral Finance Theories usually succeed in accounting for what is happening in the real world.

Therefore, to explain these abnormalities, we still have some rational theories, which can sometimes explain some of the anomalies or part of them and we also have behavioral theories, which seem to be relatively more successful.

We cannot attribute all anomalies to irrational behavior or psychological biases. Some of them may be rational, for example, the excessive volatility documented by Shiller may be due to changes in people's perceptions of risk and these perceptions may be rational, but these rational changes in risk perceptions are very unlikely to take full account of these excessive fluctuations and extreme volatility in the stock market.

So, our conclusion is that we must believe in both rational theories and behavioral theories. We should adapt a synthesis of them and combine them, because in real life we can find situations, where in each case one of these types of theories applies well and helps us to save money.

THE DISPOSITION EFFECT

We will answer the following questions:

- What is the effect of disposition?
- What is a reference point?
- What would be the impact on the overall state of the market?

We begin our series of discussions of each behavioral bias one by one with the Disposition Effect. This is probably the most common behavioral bias for private investors. Even Dr. Ülku, after so many years of experience in the market, admits that he is vulnerable to this bias.

Disposition effect is defined as the tendency of investors to hold losing shares too long and sell winning shares too soon. This may seem rational behavior at first sight.

However, it usually works to the detriment of investors.

The disposition effect results from the psychological motivation to secure gains as soon as possible and the psychological difficulty of accepting losses and sustaining them in the hope of recovery.

Usually, those winning positions, which investors tend to close out too early, tend to make greater gains. Losing positions, which private investors hold for too long, still have more losses.

The disposition effect is a behavioral bias, resulting from our fears and our hopes. When we have a winning position, we are afraid of losing those gains. This makes us motivated to close them, as soon as possible, without thinking more carefully about the potential for additional gain. When we are in a losing position, we have difficulty accepting failure. Therefore, we postpone this decision if we can.

The failure to close losing positions in time to avoid losses is due to a psychological misperception. Psychologists have provided more information on this behavioral bias.

People make their decisions with respect to a point of reference. For investors operating in the stock market, the reference point may be their purchase price. When they are above their benchmark, they want to secure those gains, as soon as possible.

So, when they are in a winning position, until they realize their profit, they have strong psychological distress, due to the fear of losing it. This forces them to act too quickly, without considering a more detailed analysis, without making a more careful prognosis, as to whether there is any future profit potential or not, and they close down their position.

On the other hand, when they are in a losing position, they do not want to realize it, because it is a painful decision. It is an uncomfortable feeling to realize a loss and not want to face it. This psychological feeling prevents them from contacting a better analysis to try to foresee if the losing position can go further down causing more losses, rather their decisions are driven by their feeling and mood and therefore they maintain this position.

This decision usually does not turn out to be rational. Private investors would have been better off keeping their winning positions for a little longer and closing their losing positions in time to avoid further losses.

Now, we can see what the impact would be on the overall market if many private investors show this bias. The consequence would be an underreaction.

Let's imagine a case where a stock trading at $10 per share gets good news, which requires the price to be around $20 per share. Informed investors receive this news and react to it by driving the share price up, but not immediately to the $20 level, but say $16 or $17.

At this point there is still some margin for profit and investors who buy these shares at $17 will make an additional $3 profit until they reach their new break-even level of $20.

However, private investors, instead of analyzing this new information and acting on it, would be driven by their instinctive behavioral bias to make their profit as soon as possible, so instead of buying at this point to boost the additional potential, they simply close their position and sell at this price.

Obviously, these stocks, which they sold, will have additional gains of up to $20. So this is a sub-optimal decision and hurts the business performance of private investors.

If many private investors commit this bias, then there will be selling pressure in the market that will prevent the stock price from dropping below $20 per share level. Rather, it will be postponed, and take longer, until the selling pressure from these investors is over and the more informed investors act to exploit the remaining increased potential.

The consequence is a slow price response, a gradual upward trend, a boost in the stock price - this is the anomaly we discussed at the beginning of the course. Behavioral bias anomaly - the effect of disposition has been linked to the low reaction:

- Because of this bias, private investors tend to follow an opposite trend (buy when the market is down and sell when the market is up) and may slow down the process by which the price adjusts to new information (otherwise, prices would adjust more quickly to new information).
- Therefore, the effect of the disposition may be one of the factors contributing to the profits of the moment.

OVERCONFIDENCE

- What is overconfidence?
- How does overconfidence affect private investors?
- What anomalies can overconfidence lead to?

We will discuss our second behavioral bias, which is overconfidence.

- Overconfidence in financial markets is defined as overestimating the accuracy and precision of one's private information, opinion, or personal beliefs.
- It causes excessive trading by investors
- Generally, excessive operations lead to poorer performance.
- Men show more overconfidence than women.
- Evolutionary biology: overconfidence increases males' chances of survival and reproduction

Thousands or even millions of investors trading in the same instrument have different opinions and obviously they cannot all be true at the same time. Some of them may be partly true, others may be partly wrong. Now consider that each one acts on his own in the formation, ignoring other possible opinions and points of view. And this trade, driven by different opinions, clashes with each other in the marketplace.

That could result in excessive trading volume, because one investor buys believing the market will go up, other sells believing the market will go down. Like any behavioral bias, we will first consider its impact on the performance of private investors and then see how it relates to behavioral anomalies observed in financial markets.

Overconfidence negatively affects investor performance.

Those who operate most aggressively are overconfident investors and, as reported in this research study, those investors achieve lower returns. There is a direct relationship between the frequency and aggressiveness with which investors operate and their underperformance.

At this point we can consider the psychological reasons behind overconfidence. We find it root in evolutionary biology. Most of our psychological behavioral trades come from instinctively evolved patterns of behavior, which helped us in the past to survive better.

Men with overconfidence had a better chance of survival and a greater chance of reproduction. That is an interesting observation. Males, who are more confident, tend to be more attractive to females.

Much research provides clear evidence that males are more trusting than females. For example, the average trading frequency of male investors is much higher than that of female investors.

Another paper provides evidence that male investors trade more aggressively than women but perform more poorly.

We have even clearer examples of this. If you ask a male student, "Do you find yourself more attractive than the average man? We know that only 50% are more attractive than the average, but when male students are asked this question 70% of them say that they find themselves more attractive than the average. With women this proportion is around 60%. "Do you find yourself a better driver than average? 90% of the males say "yes". Again, obviously, this is impossible.

Due to the roots of evolutionary biology, overconfidence has been part of our instincts, part of our natural behavior and it is normal that this bias is revealed in the financial market as well.

SUMMARY

Behavioral Bias > Anomaly

- The volume of transactions in financial markets is much higher than rational financial models predict.
- Dissenting opinions have been found to increase trading volume.
- Excessive investor confidence is one reason why conflict leads to excessive trading volume and volatility.
- Trading volume is higher when the stock market is rising, i.e. when most investors are overconfident
- The trading volume decreases as the stock market falls because investors feel less confident.

Standard Financial Theory assumes or predicts that the market should have a much smaller trading volume than is currently seen in the financial markets. When new information arrives, any sophisticated investor should interpret it in the same way, so the price should adjust to the new level very quickly without requiring much trading volume. But instead, in real life, we see much more trading volume than necessary.

Clearly such excessive trading volume must have been the result of overconfidence, some investors overestimate their opinion inaccurately.

Overconfidence also increases market volatility, when an investor acts on his information while ignoring information from other investors, then the market will move in that direction. Suppose a group of optimistic investors act on their information while ignoring others, the market goes up. Then a pessimistic group of investors acts on their information and the market goes down. Because they do not adequately expect alternative opinions, they drive the market in the direction of their opinions, leading to excessive volatility.

CONFIRMATION BIAS, OVERCONFIDENCE WITH SELF-ATTRIBUTION

We will learn:

- What is confirmation bias?
- How does confirmation bias affect private investors?
- What anomalies can confirmation bias lead to?

The level of confidence a person has in his or her own opinions, beliefs, or information is not constant all the time.

Investors disproportionately reconsider their confidence in their information or opinion when they receive additional information that appears to support them [even if only incidentally].

Confirmation bias is caused by this disproportionate change in confidence in their opinion.

Let's assume that you expect the market to go up in a bullish market outlook. And for some reason, possibly just coincidentally, the market went up a little. You may be inclined to be much more confident in your initial belief after seeing this new information. It may not necessarily support the accuracy of your initial opinion, but this will not prevent you from disproportionately improving your confidence. This may lead you to buy more at a higher level after the price increase, ignoring other alternative opinions as well.

And, at this point, neglecting other possibilities can be detrimental to your performance. We have a closely related concept called biased self-attribution

In general, human beings tend to attribute past successes to their own abilities, to their own capacities, even if they have been purely driven by luck.

When you have a long position in the stock market, the market may rise, just by chance, and you say to yourself "Hey, I correctly predicted this rise, therefore I am a skillful investor". So, you will increase your self-confidence.

This biased self-attribution can lead to an increase in your overconfidence.

Again, think of an example. You just bought a stock at $10 a share. You may have some positive information from those shares. And not necessarily because your information was correct, but because for some reason, the stock market went up.

Therefore, from this point on, he will be inclined to attribute this gain to his own ability and this increased confidence will lead him to underestimate the importance of alternative information or other opinion.

Now let's discuss what these two biases - confirmation bias and overconfidence with self-attribution, can lead to in the market with all investors commonly vulnerable to these biases.

They will lead to an overreaction.

Overconfidence and self-attribution

+

Confirmation Bias

=

Exaggeration and bubble

Consider the example of the NASDAQ. Perhaps at first many investors doubted that new technology stocks had great potential. But after they saw an increase in the early years of the NASDAQ bull market, they became overconfident. They began to overestimate the accuracy of their initial opinion. Because they now have more confidence in their own opinion, in their own skills and abilities, they would dismiss any counterinformation and deny the likelihood that their success was driven by any chance - they would attribute it to their own skills!

Therefore, some of the achievements of the drive we have discussed above may be due to continued overreaction, which can be caused by confirmation bias and self-attribution bias. Therefore, part of the continuity of the trend may be driven by these biases. Of course, this part of overreaction will be followed by an imminent reversal.

REPRESENTATIVENESS BIAS, OVERCONFIDENCE WITH SELF-ATTRIBUTION

We will learn:

- What is representational bias?
- How does representativeness bias affect private investors?
- What anomalies can representativeness bias lead to?

Representative bias is perhaps the most clearly observable bias in financial markets.

- Representative bias is defined as the human tendency to be overwhelmed by the most recent and important observations
- It creates one of the best opportunities in the market.
- Buying when the panic that follows the disaster reaches an overreaction point.

In financial markets, catastrophic, unexpected, surprising, and recent events that attract attention make people overreact to them. Ignoring or forgetting the fact that, its effect will be temporary, everything will return to normal sooner or later. We said that this is probably what is seen most clearly in the financial markets, because you must have seen the strong effect of natural disasters or terrorist attacks by the sharp declines in the stock market that follow them. These sharp declines in earnings opportunities, if you are calm enough not to be overwhelmed by those declines, you could make huge profits.

Let's look at the markets' response to the September 11 terrorist attack in the US: the market declined sharply, but if you bought during the week following the event, you could have made a huge profit from the rebound during the following weeks.

But remember that in those days many people said, "New York is no longer a safe place to live". I will sell my house in New York and live somewhere else" This was the reason why some investors for selling at exceptionally low prices after the attack with all the media coverage reinforced this emotion causing an overreaction.

Obviously, the psychological atmosphere of those days was not rational. Eventually everything goes back to normal and now we do not remember those fears, everybody still lives in New York, life goes on as usual. Those people, who sold out following the panic event, now regret their decision.

Another interesting example is what happened after the 2011 earthquake in Japan. The market fell sharply, but it did not take more than 3 or 4 days to recover almost completely.

If you had bought after the earthquake you would have made a significant profit in a noticeably short time.

No panic situation lasts forever. Just remember this and try to take advantage of other investors' panic after such disasters. If you can implement this strategy after every terrorist attack or natural disaster, you can make a fortune.

Let us look at another example with aviation disasters. When an airline has a plane crash with a large amount of fatalities, people hesitate to buy plane tickets from that airline and, as a result, investors overreact by selling their shares of that airline. According to research, the average number of victims after each of these air disasters is around one billion dollars.

We can now summarize the impact of the representativeness bias for the whole market. As you will have seen in the examples above, the representativeness bias leads to an overreaction. This overreaction is followed by a rapid reversal, especially when it is caused by a natural disaster or a terrorist attack,

something that creates panic. Obviously, these extreme actions, overreactions and subsequent reversals create excessive volatility.

Another type of representational bias may be due to the prevailing emotion in the market. Again, think about the NASDAQ bubble. In the final years of the NASDAQ race, people were so overwhelmed by the huge profits that investors in the new technology had made. The returns earned were 400-500% in one year. Everyone was focused on this; all the media was covering these stories.

So, when a certain belief dominates the market, investors can be overwhelmed by it, this can add to the continuous overreaction, it can contribute in the shaping of the bubble.

Normally, during the last stages of bubbles, the representativeness bias favours their formation by allowing people to forget about them and return to normal life.

SUMMARY

What we have learned so far...

- Financial markets are efficient and inefficient. They are the domain of rational theories, standard financial theories, as well as behavioral theories.
- We should believe in both rational theories and behavioral theories. We should combine them, because in real life we can find situations, where in each case one of these particular types of theories applies well and helps us save money.
- There are certain anomalies that Standard Finance theory cannot explain and that is where Behavioral Finance comes in.
- Financial markets do not behave as prescribed by scientific models; we have anomalies, which create predictable patterns and profitable opportunities for investors.
- Anomalies offer opportunities to forecast future market movements and obtain abnormal returns
- To explain these anomalies, more realistic scientific models, i.e. behavioural theories, incorporating human prejudices, are needed.
- Trading volume is higher in growing markets and lower in declining markets.
- Excess trading volume and excessive volatility are due to overconfidence.
- Overconfidence is based on past gains and losses.
- The confidence of private operators depends on market trends.
- Adjust your confidence level based on the accuracy of your information.

BIAS

- Overconfidence and confirmation bias can lead to overreaction and bubble formation followed by reversal.
- When too many people have the same opinion, it may be time for the reversal, and you should change your position.
- Representational bias is most vivid when there is a disaster or abnormal situation.
- The representativeness bias leads traders to ignore the big picture and concentrate on the latest information received.
- Representativeness bias causes the market to overreact.