

Risk tolerance and anchoring

CTIBOR PILCH

Abstract

According to traditional financial theories, all financial market participants think and act rationally. Their preferences will immediately adapt to new information and will be based on maximization of benefit theory. This theory is logical, but fails when applied to real life. That is why, in response to the malfunction of the theory of efficient markets and rational behavior models, in practice, a new approach to explaining the behavior of financial market participants has been created, namely behavioral finance. Theories of Behavioral Finance say that some financial issues and phenomena can be better described and understood. When we use models where subjects do not have to act rationally. According to this theory, there are many deviations from rationality. Some are described better, others less. Some are emotional-dependent, they are called emotional. Others, emotional-independent, are called cognitive. Two of them, one of each group, are analyzed in the present submission. These are Tolerance to Risk and Anchor Deviations. The results of a sample survey of 1,350 respondents by the contributor document the fact that the deviations exist despite age and education.

Keywords

Risk, risk tolerance, anchoring, cognitive deviations, emotional deviations

JEL classification

G21, G23

Introduction

Some deviations from rationality are so-called "Adaptable", because they allow people to adapt to certain situations and take more efficient and quicker solutions. These solutions are not based on detailed rational analysis, but on the use of cost-effective and intuitive designs. Other deviations from rationality arise as a result of the fact that people do not have the right mental mechanisms developed to solve some of the problems, or use mechanisms that are not very suitable for dealing with these specific problems.

For practical use, deviations from rationality can be defined as systematic errors of investors in collecting, analyzing and evaluating information, and then in making economic decisions. It is indeed a systematic error, because a random error does not have to mean a deviation from rationality. The current science of behavioral finance recognizes many deviations from rationality and their number is probably not the end. Some deviations overlap substantially or may be the result of others. Derogations from rationality can occur at any stage of the decision-making process. Starting from the form in which the new information is presented, until the decision is taken. For the purposes of this submission, it seems better to break the deviations by nature. According to this criterion, we break the deviations from rational behavior into cognitive, emotional and mixed. (Some sources refer to the cognitive and emotional breakdown only, we do not see it as sufficiently precise)

A.) Cognitive deviations

Cognitive deviations from rational behavior are usually based on incorrect collection, analysis, and interpretation of information. They can be corrected by learning, possibly by appropriate financial advice. It should be noted that science can not satisfactorily explain the origin of these deviations from rationality.

B.) Emotional deviations

"Emotional deviations from rationality in thinking and acting are conditioned by emotional factors, especially by desire and concern. Not every emotion must be an expression of irrationality. Emotions, however, support the adoption of fast and economical decisions that are beneficial especially when the problems are very complex and their rational solution would take more time than is acceptable. In certain situations, however, emotions can suppress rational thinking and result in harmful or irrational action. " Changing emotional inclinations is much more difficult than cognitive deviations. Emotional deviations are generally divided in the literature according to their origin in mental mechanisms to:

- 1.) Derogations that support a willingness to believe something, which affects positive feelings, even in cases where there is evidence of a false perception of specific phenomena.
- 2.) The deviations that make people strong when refusing to accept phenomena and events that are unpleasant to people. These are mainly aversive emotions.

C.) Mixed deviations

Individual deviations are often intertwined. We do not always know clearly whether a deviation is cognitive or emotional. Typically, they include both. They are usually a combination of these, and it is unclear whether emotions predominate, or misinterpreted information. Until now, the distribution of deviations has been based mainly on their external manifestations and usually reflects some of the decision-making process in which they occur, or follow the nature of the deviations. In this paper, I will focus in detail on one deviation from the emotional category, namely "Risk tolerance" and one deviation from the cognitive category, to a deviation called "Anchoring".

1.Tolerance to risk.

From the point of view of declared and true behavior on financial markets, we can distinguish subjective and objective risk tolerance. Subjective risk tolerance is given by the individual's attitude towards the risks, attitudes, and preferred pattern of behavior in the area. Subjective risk tolerance is measured in financial practice by self-assessment of the client, most often based on the completion of a specific questionnaire, possibly through an interview with the client and his financial advisor. The great advantage of detecting subjective risk tolerance is that it allows people to express risk preferences to those who, because of external factors, have to choose less risk decisions. The disadvantage of detecting subjective risk tolerance is the sensitivity to the formulation of questions. B. / Objective risk tolerance is given by real patterns of individual behavior. In the financial field, for example, the share of risky financial products in the overall structure of the portfolio. In financial practice, however, it is not easy to ascertain the exact volume and structure of an individual's property. To determine the tolerance, resp. Individual aversion to financial risks, it is appropriate to combine both types of surveys, subjective and objective. Several studies have shown that there is a relatively strong correlation between subjective and objective tolerance. After eliminating external factors, especially socio-cultural and socio-economic, subjective and objective tolerance should overlap. Different levels of risk tolerance between individual social, economic and demographic groups are most likely due to evolutionary adaptation. In older times, for example, higher hopes for survival were vital, persistent and agile individuals who were able

to cope with the physical hazards presented to them by the surrounding environment. At present, individuals who know how to deal with risks in business, financial markets, sports, and so on are most supported. However, cultural factors also affect the level of risk tolerance. A large part of the personality identity is created under the influence of a particular social group, such as a nation, ethnicity, religion, employment, etc. Individuals take the norms of these social groups and identify them to a greater or lesser extent. Some religions, for example, forbid their gambling members, while others reserve some risky activities, Sport, or business for men only and so on. Genetic, biological, social and economic factors are combined with each individual. Given the current state of knowledge, it is not possible to precisely determine the proportion of each factor on the risk tolerance level. However, risk tolerance research shows that individual differences in tolerance are significantly higher than differences between groups. For example, many research has shown that women have less risk tolerance than men. However, this does not mean that every woman is necessarily less tolerant of risk than a man. The range of risk tolerance within each gender is much higher than the margin of tolerance among genera. Risk tolerance is manifested in very different situations, from sport, through the style of driving, lifestyle, type of work to investment in financial markets. In the literature, risk tolerance has long been debated whether there is any fundamental tendency towards higher or lower risk tolerance in general or whether a particular individual tolerates different types of risk in another way. There are, for example, people who engage in extreme sports, but in their financial portfolio they have predominantly conservative financial products. On the other hand, there are cases where investors have risky financial products but prefer a conservative style to their personal lives. However, the mismatch between tolerance of financial risks and other types of risks can also be caused by factors such as limited knowledge of financial products, limited access to financial markets (for example, due to low incomes), a small supply of risky financial products at a particular time, place, (For example, before 2000 there were no equity funds in Slovakia, and almost all investors could only choose from conservative financial products even though some would prefer products with a higher degree of risk and yield). External circumstances, including cultural and social impacts, can significantly alter the natural tendency towards higher or lower risk tolerance.

Factors influencing tolerance to risk:

- Male: Generally, men have a higher risk tolerance than women. This view is confirmed by individual studies and analysis of several studies on gender differences in risk tolerance

Vedecký časopis FINANČNÉ TRHY, Bratislava, Derivat 2020, ISSN 1336-5711, 4/2020

(Byrnes, Miller and Schaffer, 1999). This study, among other things, states that men showed higher, sometimes significantly higher, risk tolerance in 14 out of 16 types of risk behaviors.

- Age: Several studies agree that the risk tolerance increases with increasing age. For example, research by Claudius Sahm (2007) indicates that HRS respondents (mostly people aged 50 and over) each year will experience a general tolerance for risk

1.7%, i. About a fifth in 10 years. The most striking is the aversion to risk after the 65th year of life. The influence of age may, however, be altered by education. Highest levels of education are reached after reaching the age of 25, respectively. In many cases even later. Because education is positively correlated with risk tolerance, two differently equal persons at the same age may have a different risk tolerance in view of the different levels of education attained.

- Education: Virtually all research on tolerance of financial risks is in the opinion that educated people are more tolerant of risks. The causes and direction of this is not clear. On the one hand, it can be assumed that educated people can better assess the risks and thus better tolerate them (people usually have the most concerns about things they do not know or understand). Education can give people a sense of competence that is proven to increase their willingness to take risks, even if their competence fails to cope with the actual knowledge of the phenomenon. On the other hand, education itself may be more tolerant of risk. In particular, college education is associated with accepting income loss during the study period. Another factor that blurs the impact of education on the tolerance of financial risks is the income or wealth of wealth. The amount of income and wealth is usually correlated with education, because educated people earn more on average. Rich people have more risky products in their portfolios. However, in particular, people with higher education tolerate financial risks better than people with primary and secondary education.

These factors will be discussed in more detail.

The other factors then belong

- Type of economic activity
- Income and wealth
- Source of wealth
- Life cycle phase

On a survey of 1350 respondents surveyed between 2012 and 2016, I tried to prove the validity of some of the claims in the previous text. And so to prove the existence of some deviations from rationality and their dependence on various factors. The sample consisted of 1150 students from the University of Economics and 200 students from the Faculty of Civil Engineering of the Slovak Technical University in Bratislava.

The first part of the questionnaire focused on the tendency of respondents to risk.

1. What do you think first of all, if you hear the word "risk"?

Results 1	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
Mainly Danger	12 %	28 %	10 %	25 %	14 %	31 %
More uncertainty	42 %	66 %	35 %	59 %	39 %	61 %
Rather Opportunity	22 %	4 %	29 %	12 %	27 %	35 %
Extreme excitement	24 %	2 %	26 %	4 %	20 %	3 %

2. What do you think are your investment experiences?

Results 2	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
I do not have much experience so far.	38 %	72 %	22 %	65 %	36 %	66 %
I have some experience	26 %	22 %	33 %	25 %	31 %	27 %
I have average experience and I know what revenue I can expect from a certain type of investment	34 %	4 %	38 %	7 %	32 %	6 %
I am experienced and have enough knowledge about investing	2 %	2 %	7 %	3 %	1 %	1 %

3. What kind of financial products do you have your own experience with? (Please mark more options)?

Results 3	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
I have a term deposit at the bank	15 %	16 %	22 %	9 %	21 %	9 %
I have a life insurance policy	44 %	48 %	40 %	51 %	39 %	49 %
I have building savings	26 %	20 %	27 %	29 %	27 %	21 %
I have a savings account, resp. other	15 %	16 %	11 %	11 %	13 %	21 %

4. You have to choose between a certain but less paid job or a less secure but more profitable job or business. Which option do you choose?

Results 4	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
I'm sure, longer employment, less paid	6 %	22 %	2 %	15 %	10 %	19 %
I prefer a little bit less certain place, but with perspective growth of salary	26 %	62 %	23 %	63 %	22 %	61 %
More likely a less secure place, but with a perspective higher wage growth	40 %	12 %	41 %	14 %	35 %	13 %
The possibility of high earnings is for me more than job security	28 %	4 %	34 %	8 %	33 %	7 %

In my first question, I understand the risk as an opportunity, less of a danger. Women are more cautious and less brave in our sample than the average of our sample. The bold group in the "Main Opportunity" and "Excitement" rows oscillating up to about 50%. The behavior of our sample moderately supports the claim that people with higher education have higher tolerance for risk.

In the second question, which examines investors' investment experience, the survey has come to pass: our students are re-evaluating their experiences and unrealistically evaluating their experiences (about 60% of them are considered as experienced investors, or have the impression that their knowledge is reasonable One third is willing to admit that it does not yet have much investment experience.

There is another question about personal experience, especially lesser-known (so-called) financial products. Approximately 70% of respondents report that they have a life insurance policy and building savings, that is, the low-risk products they have made in most of the cases their parents. The fourth question, which looked at the preference for a smaller, but more onerous salary or uncertainty, came as follows: Our students prefer the possibility of higher earnings; only about 2-10% of men and 15-22% of women prefer. This also confirms the high risk tolerance of our respondents. It is related to higher education and lower average age. We observe somewhat lower risk tolerance for Students at the Faculty of Civil Engineering. They are probably aware of a smaller range of economic knowledge than students of the University of Economics. However, the stated risk tolerance is quite large.

In general, young people and people without a commitment tend to risk more behavior. We justify this with a low level of life experience, and with whoever does not have a family, he has almost no responsibility for his surroundings. Considering that the observed sample has an average of 23 years, it can be assumed that it has no obligations.

2. Anchoring

Anchor is a deviation by means of which the person in determining whether or not to estimate any value of the magnitude is based on the first information that is available.

This information is often very inaccurate, it is misleading, and sometimes unrelated to the problem. In the event that further information is added which can shift this value in both directions, ie upwards or downwards, the person usually takes the first value as a refrain. The following are examples of this.

Read questions carefully and answer:

Question # 5.

A) How many people do you think is the second largest city in Russia - Sankt Peterburg / in Slovakia the name of Saint Petersburg /? If you do not know the exact answer, do not mind, try answering other questions:

B / Is there more than 2 million inhabitants? / Do you think the right answer / yes no

Ca / If you answered yes, then answer: is this more or less than 2.5 million? Circle the answer that is closer to you / less

Cb / If you did not answer, then answer: is it more or less than 1.5 million? Circle the answer that is closer to you / less

D) How much do you think it is about? / Write the amount in millions /

Results 5	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
Actual value	5 mil.	5 mil.	5 mil.	5 mil.	5 mil.	5 mil.
Average estimate	3,91 mil.	3,2 mil.	4,4 mil.	3,7 mil.	3,2 mil	3,4mil
Number of responses in boot interval	43 %	45 %	44 %	47 %	43 %	49 %

Although Sankt Peterburg has 5 million inhabitants, the average estimate was 3.71. But it is more than the data interval we have provided to the respondent. This anchorage was not very noticeable even though the number of people in our introductory interval was 43-49%. An additional 51% of the people could not be caught. Probably it's because we chose a little interval.

Question # 6.

A / What large area in km² do you think China has? If you do not know the exact answer, do not mind, try answering other questions:

B / Is it more than 5 million km²? / Do you think the right answer / yes no

Ca / If you answered yes, then answer: is this more or less than 6 million? Circle the answer that is closer to you / less

Cb / If you answered no, then answer: is it more or less than 4 million? Circle the answer that is closer to you / less

D) How much do you think it is about? / Write the area in km²/

Results 6	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU
Actual value	9,6 mil. km ²	9,6 mil. km²	9,6 mil. km ²	9,6 mil. km²	9,6 mil. km ²	9,6 mil. km²
Average estimate	5,47 mil. km ²	5,1 mil. km²	5,2 mil. km ²	4,82 mil. km²	5 mil. km ²	5,4 mil. km²
Number of responses in boot interval	61 %	62 %	67 %	65 %	66 %	68 %

In this case, the estimate is very different (almost half) and, on average, 65% of respondents have suffered the anchor caused by the information provided.

Question # 7.

A) How many inhabitants does the Slovakian city of Prešov have? If you do not know the exact answer, do not mind, try answering other questions:

B / Is there more than 50,000 inhabitants? / Do you think the right answer / yes

Ca / If you answered yes, then answer: Is it more or less than 55 thousand? Circle the answer that is closer to you / less

Cb / If you did not answer, then answer: is this more or less than 45 thousand?

Circle the answer that is closer to you / less

D) How much do you think it is about? / Write the number of inhabitants in the whole thousands /

Results 7	1st year	1st year	3rd year	3rd year	5th year	5th year
	Men EU	Women EU	Men EU	Women EU	Men SvF STU	Women SvF STU

Actual value	91,8 tis.	91,8 tis.	91,8 tis.	91,8 tis.	91,8 tis.	91,8 tis.
Average estimate	63,2 tis.	56 tis.	66 tis.	52 tis.	51 tis.	52 tis.
Number of responses in boot interval	41 %	63 %	47%	71 %	72 %	72 %

Given that 99% of our respondents live in Slovakia, we assumed that the third largest city in the Slovak Republic would not even be anchored. But we were wrong. The estimate differed by one third, more women, and 49% for men and 69% for women. Here too the anchor works.

Conclusion.

In general, young people and people without a commitment tend to risk more behavior. We justify this with a low level of life experience, and with whoever does not have a family, he has almost no responsibility for his surroundings. Considering that the observed sample has an average of 23 years, it can be assumed that it has no obligations.

Men are more prone to risk than women, and are more tolerant of risk. Some authors justify this by the division of labor in ancient times, where men have riskier activities. Women are less interested in investing, less interested in less interest, so they are likely to be less competent in financial matters than men, so they are less willing to take the risk. They take investment decisions at a higher degree of uncertainty than men, and therefore choose more conservative investment strategies than men. Men are considered more experienced and better informed. It is usually excessive self-confidence. Women's decision-making is more responsible.

Even the existence of a deviation has been confirmed.

Although our students also studied geography, it was confirmed that the data we wanted to obtain from them underwent this deviation. A substantial majority of them fled to the first possible misleading information. And the results were the same.

Literature

- [1] BALÁŽ, V. Systematické chyby, ktorých sa dopúšťajú investori. In: *Investor* 3/2008, str. 47, Bratislava, EKOPRESS, ISSN nepridelené
- [2] POKLEMB, P. *Profily a dlhodobé investičné stratégie slovenských investorov*, Bratislava : PÚ SAV 2010, dizertačná práca
- [3] TRIMPOP, R. *The Psychology of Risk-Taking Behavior*. 1994. (Amsterdam: North-Holland).
- [4] BYRNES, J. – MILLER, D. – SCHAFER, W. Gender Differences in Risk Taking: A Meta-analysis, *Psychological bulletin*, 1999, Ročník 125, číslo. 3, s. 367 – 383.
- [5] SAHM, C. *Does Risk Tolerance Change?* [Job Market Paper.] Michigan: University of Michigan 2007.

Contact

Ctibor Pilch, Ing., PhD.
University of Economics in Bratislava
Dolnozemska cesta 1
852 35 Bratislava
Slovakia
pilch.ctibor @ derivat.sk