

# Thinking fast and slow in business decisions

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*Abstract: Economics is built on the assumption that humans are rational beings with clear and consistent preferences, based on which they can maximize utility. Behavioral economics aims to confute this view and explain why real-life decisions are often completely different from what classic economic theories would predict by finding patterns in what seems to be irrational behavior. In this article, I review significant pieces of literature and present the results of my research, showing that the heuristics, biases and fallacies described in the literature can be clearly predicted in advance.*

*Keywords: Behavioral economics, cognitive biases, decision fallacies, heuristics*

## 1. Introduction

Despite some recent acknowledgements Behavioral Economics (BE) is still a marginal field in Hungarian economic and management discourse. I believe that the main reason for that is its human nature, since we tend to feel that the heuristics and biases being explored through BE are just so natural or even obvious – why bother with scientific research to study them? However, this in itself is a fallacy, resulting in the big gap between academic research and practical matters in life such as business. Economic models have to describe elegant theories, supported by complex mathematical substantiation, that cannot just be observed (or even understood) by *anyone*. However, the real subjects as well as beneficiaries of economics are mostly these “*anyone*” – employees and employers, executives of corporations or public officials, and this often decreases the relevance or even the validity of the elegant theories. Make no mistake, I am not speaking against the procedural correctness and high standards of scientific research. These are and must remain the basics of any emerging scientific field, but the complex procedures should not be “L’art pour l’art”, and I would like to point to the contrast that the practicality of BE research is offering. I believe that BE can bring academic

research closer to the “real world” thus contributing to the improvement of several areas such as business or public decision making.

The growing importance of BE is clearly shown by the fact that two of the most prominent figures of the area have been awarded the Nobel prize in economics – Daniel Kahneman in 2002 and most recently Richard Thaler in 2017.

In this current article, I will first summarize the basics of BE and point to the necessities that brought it into existence. I will introduce some of the most prominent researchers of this field and briefly discuss their contributions. After that I will describe in more details some of the basic biases and heuristics, which were also in the focus of my own research. In my primary research, I have created a questionnaire which was filled by people I know. It is possible to use quantitative methods to analyse the results of the questionnaire, but I decided to limit these to a minimum (such as expressing simple percentages). Also, my sample is not representative and random – therefore this study would just lack the criteria for producing valid generalizable results. After I closed the poll, I made short interviews with several respondents, to find out in a bit more detail why they made the decisions they made, to see if their answers could be predicted by the findings of BE.

The aim of my research was to prove the observability of these specific cognitive biases and heuristics. It was not aimed at finding overarching general conclusions about people or certain groups of them – this is certainly an interesting task as well but out of the scope of my current proceedings.

## **2. Behavioral Economics**

BE is a relatively young discipline within social sciences which combines the elements of psychology and economics. Its most foundational features include the questioning of classic economic rationality, and the search for reasons behind irrational human behavior in decision making.

In mainstream economics one of the most prevalent principles is that people make their decision based on rationality. To define it in simple terms, rationality means that we make our decisions in a way that they serve our own best interests, so that they lead to a state which is most favourable to us, or as economists say, it has the highest possible utility for us. The theoretical background of this relies on utilitarianism, methodological individualism, rational choice theory and expected utility theory. The rational individual is supposed to have a system of preferences which can be measured on an ordinal scale, which means that in case a decision needs to be made, they consider the possible alternatives and their expected outcome, assign an expected utility for them and rank them based on this, eventually choosing the one with the highest rank. The preferences of a rational decision maker are complete – they can rank any two goods based on their utility, meaning that be-

tween goods “A” and “B”, it can always be decided that “A” has at least as high utility as “B” or the other way around. Their preferences are also transitive – if “A” is preferred to “B” and “B” is preferred to “C” then this implies that “A” must be preferred to “C”. Also, the system of preferences for an individual is revealed in their decisions, which implies that if they choose “A” in a given situation, where “B” is also available, they prefer “A” to “B” (or at least they are indifferent) and therefore in any other situation, where both “A” and “B” are available alternatives, “A” will be chosen again (except for the rare cases where they are indifferent). This system of paradigms became widely accepted by the end of the 1950’s and has been dominant in economics ever since [2] [3] [4]. Despite this dominance, various alternative ways of investigation on how business decisions are made have been emerging [14].

Herbert Simon was among the first to challenge these paradigms, coming up with bounded rationality theory. Simon argued, that for the analysis of human decisions, we should use models that consider the boundaries of gaining and processing information [10]. In economic theories, the decision maker is supposed to be able predict all possible outcomes of a decision, must be able to assign an expected utility to them and must make the decision based on ranking those into an exact order. However, there is just no empirical evidence confirming that this would really happen (on the contrary, empirical studies later have proven the opposite). Therefore, Simon suggest the formation of new models with significant simplifications. He also introduces the concept of aspiration levels – according to this concept the decision maker will not look for the optimal outcome (the one where utility is maximized), they will look for the first outcome which is „good enough” for their aspiration level. However, the aspiration level may vary in time and might be influenced by several factors not considered by the rational paradigm, such as the time available for a specific decision, the importance of that decision for the individual or just current mood of the decision maker.

Richard Thaler, a distinguished figure of BE, continued to lay down the foundations of the emerging discipline in the 1980’s by publishing BE articles in a dedicated section of the Journal of Economic Perspective throughout the decade. The first article in this section is about the “January effect”, an observation which is just not possible to explain with any rational model [11]. Thaler describes that based on the historical data of several stock indexes comprised of smaller firms, there is an obvious trend which shows that small firms’ shares bring substantially more profit in January than in any other month of the year. In fact, this contradicts the predictions of the generally accepted, rational choice theory based CAPM model. Thaler does not provide a definitive answer to the cause of this phenomenon, but suggest a few reasons which are based on the fallible nature of human beings.

Thaler in his later works [12] [13] also introduced the term “Econ” to describe the subject of the classic economic discourse in opposition to the Humans, who are actually making real life decisions. His most important contribution is arguably

presented in his book co-authored by Cass Sunstein, *Nudge: Improving Decisions about Health, Wealth and Happiness* [13]. In this book, he builds on the findings of BE, and proposes solutions for making public and private decisions easier and resulting in more desirable outcomes. He promotes the view of libertarian paternalism, a somewhat paradoxical approach to those who influence decisions (whom he calls decision architects).

In this framework, it is suggested that governments and businesses who have influence on how individuals will make important decisions, should use nudges – constructing decision situations in a way that they push people to make better decisions, but at the same time leave complete freedom for them to choose any alternative they prefer [13]. One of the most prevalent examples of this is the use of defaults. Due to inertia and the general lack of attention and mental effort, humans quite often choose not to choose, and stay with the default option even in case of very important and consequential decisions. Thaler demonstrates this through the health care contribution system in the United States. In many cases individuals could basically get free money in the form of employer contributions, which they miss out on because it is not granted by default. By changing the defaults, decision architects can contribute to a far better overall state without any enforcement or reduction in freedom of choice for individuals.

Another example of a nudge used in the area of savings is the “save more tomorrow” [13] plan. When we make decisions about savings, it requires a lot of discipline to sacrifice current benefits for future ones, and therefore we often fail to save enough. However, if we do not have to sacrifice current pleasure, but we can do that with future ones, we are usually much more convinced to do so. The ingenious “save more tomorrow” plan consists of the following – when deciding about savings for retirement, the rate of savings is increasing with future salary increases, so we do not need to trade present day money for retirement savings, we trade less distant future money for more distant future money, which in general, we can much more easily commit to.

Kahneman’s book, titled *Thinking, Fast and Slow* summarizes his vast amount of work done in the field of BE [6]. The basic framework of the book is provided by the theory, that in order to better understand our behavior, we can interpret the human mind as an entity formed by two systems. Kahneman describes the two systems in a magnified and even personalized manner, almost as if they were caricatures, in order to better facilitate the understanding of his message.

System one is responsible for thinking fast and it plays the primary role in our decisions. We can say that this system is used by default, since it does not require mental effort and the supervision of our consciousness. It varies from one person to another which decisions are made by system one. Part of this is inherited or acquired during physiological development (e.g. recognizing the direction and the source of a sound or our reactions to the manifestation of basic emotions of others), while some things are learnt but so deeply internalized that they become

automatic (to understand a short sentence on our native language or the first impressions we form about another person based on their clothing). It is important to see that these things happen unconsciously, we hardly ever question or reconsider what we think or do with the use of system one.

System two works on complex situations which require our conscious efforts. Its operation has physiological signs (such a changing use of glucose by the nervous system and dilated pupils) and its operation requires increased use of resources. System two is in effect when we solve a difficult math problem, we force ourselves to pay attention on a lecture, or we consciously try to estimate if the price of a good in a transaction represents its true value. System two is also responsible for self-control, or we should rather say control over system one. However, the operation of system two is costly (the phrase “pay attention” captures it really nicely) therefore we often fail to activate it in situations, where it would be desirable. These situations, where we use system one instead of system two will lead to heuristics, cognitive biases and decision fallacies.

### **3. Heuristics, biases and fallacies**

We often make mistakes in our decisions, and we are more or less capable (and hopefully also willing) to realize this. The realization might be intuitive, or could happen as a result of conscious auditing of ourselves – remembering what we did and comparing it to what we should have done in an optimal case. This audit process can reveal the heuristics we use or the fallacies we commit in our decisions and this provides the robust content of behavioral economics studies. It is not my intention to introduce all of these here, instead I have singled out a few of them, which definitely have great influence on our lives, and I will describe them in more detail. I will continue to use the framework of Kahneman [6] to illustrate how they work and how they impact our decisions.

#### **3.1. Cognitive ease**

According to Kahneman [6] in general the use of system one can be associated to a relaxed and good mood which we can describe as cognitive ease, while system two operates when we are somewhat uncomfortable and in need and he calls this state cognitive strain. When we are in the state of cognitive ease, we feel comfortable and content, our thoughts flow freely and without any supervision. Conversely in the state of cognitive strain, we are very much aware of what we think or do, we are sharp but we have a feeling of tension and we might experience a lack of creativity.

In my questionnaire, I wanted to test if respondents were in the state of cognitive ease and catch their system two off-guard with the following question: *A phone and a headset together cost HUF 110 000. The phone cost HUF 100 000 more than the headset. How much does the headset cost?*

No specific mathematical skills are required to answer this question correctly, still I expected several incorrect answers. I know, that every single respondent is capable to calculate the correct answer, but I assumed that lot of them would not slow down to really think this through, instead they would just give the answer that comes to their minds first. This is exactly what happened – one third of the respondents gave the *expected* wrong answer, HUF 10 000 instead of the correct answer which is HUF 5000. My assumptions were also confirmed by those whom I interviewed afterward. They just gave the answer that first came to their minds and certainly knew and admitted their mistake when they saw the question again. Those who gave the correct answer, also gave interesting feedback: despite my efforts to hide it, they realized I wanted to trick them, which summoned their system two to check the problem more carefully and make sure that they give the correct answer.

### **3.2. The law of small numbers and how stories trump data**

To discover the world around us in an objective manner, we need to use the mechanisms of system two. Kahneman [6] refutes this with a daring example – he shows how often highly qualified and experienced scientists (including himself) fall victim of avoiding the strain of using system two when selecting sample sizes for their experiments: instead of the statistical calculations that would justify a certain sample size they select the size of their samples based on intuition, and this often results in their findings being statistically inconclusive. In most cases, however, this will not lead them to the conclusion, that they might as well be wrong, since the story behind their research and theory is there to make up for the lack of conclusive results in the experiments. This phenomenon was also described and confirmed by John P. A. Ioannidis [5]. Kahneman – not without a sense of irony – calls this the law of small numbers: scientists believe that in their experiments the law of large numbers applies to the small numbers of their samples as well.

We have to admit that we commit the same fallacy in our decisions in everyday life all the time. When we purchase certain items, we might not rely on rationality at all (impulse buying), but even if we believe we are being careful and thorough we often rely on the law of small numbers. What we quite often do when we buy a car for example is that we ask our friends and colleagues if they have good or bad experiences with that brand or model, we are considering and we will heavily rely on a few opinions when we make our decision. However, we need to realize that the sample we have is very small, and making a decision based on that is only slightly removed from deciding randomly.

Causal relationships and plausible stories are much easier to comprehend, therefore we are looking for these in our decisions instead of quantitative information. I wanted to test this in my questionnaire with the following question:

*You are about to buy a new cell phone, and you managed to narrow down your decision to two models that you like, and you know the following about these:*

- *Model “A”:*
  - *Three of your friends are very satisfied with the same type of phone*
  - *Reliable statistics prove that one out of ten thousand pieces of this model is defective*
- *Model “B”:*
  - *One of your friends brought the same type of phone, but needed to return it due an issue with its camera*
  - *Reliable statistics prove that one out of hundred thousand pieces of this model is defective*

If we look at this decision with the correct numerical mind-set, model “B” is certainly the better decision, since we have quantitative measurement with sufficient sample size about the chance of being defective. However, if we have contradicting information with insufficient sample size, but a plausible story, we can expect that the stories will trump statistics. My assumption on that was confirmed by the respondents, since 57% of them chose model “A”. I also had very interesting feedback during the interviews about this question, one person clearly said, that he knows that the first model was inferior in terms of statistics, but for him, it is more comfortable to listen to the advice of friends.

Sales experts, marketers or populist politicians are very well aware of this phenomenon, and rely on it every day to convince people to make decisions in their favour. When they want to influence people, they are not showing complex statistics and quantitative proof – they present relatable stories, and they often have great success. We have to realize that the reason why this works on so many people is not the lack of intelligence as often suggested, but simply the fact that our intuitive judgement relies on system one, which is able to process stories but not statistics.

### **3.3. Loss aversion and the endowment effect**

Kenrick et al. [8] see our evolutionary development as the originator of our decision fallacies. They coined the term deep rationality, describing the concept that our reactions to the outside world were not developed according to the principles of microeconomic rationality. The picture that Sagan [9] gives about humans resonates with this idea – he explains that our brain is built on the same structure that we inherited from fish and reptiles, and these parts of the brain also operate

the same way as they did for our long-time ancestors. These thoughts are reflected in a formalized manner in *prospect theory* by Kahneman and Tversky [7].

Prospect theory is built on the assumption, that when we weigh options in a decision, contrary to the assumption of expected utility theory, we are not considering the utility of states achieved by each possible outcome of a decision, but we are looking at the gains and losses compared to the status quo. One component of the theory is the certainty effect which shows that we are willing to choose certain gains over gains that have higher expected value but are not certain (e.g. it *seems rational* to take a certain gain of 500 000 HUF over a bet where we can win 600 000 HUF with 90% percent chance and win nothing with 10% chance). This effect is reversed in case of losses, where we are most often willing to take the risk of losing more in order to avoid a certain loss (e.g. most of us would prefer the chance of 10% for losing nothing and 90% of losing 600 000 HUF to losing 500 000 HUF for sure). This is called the reflection effect and it violates the predictions of expected utility theory.

The most prevalent finding of prospect theory is that “losses loom larger than gains” [7]. In more scientific terms, we value a specific amount of gain less than the same amount of loss, and X amount loss has a value of approximately the double of X in gains. When we represent this in a coordinate system, we get the value function first outlined by Kahneman and Tversky. The value slope is always considered against a definite point of reference (most of the time this is the status quo), it is concave on the area of gains and convex on the area of losses.

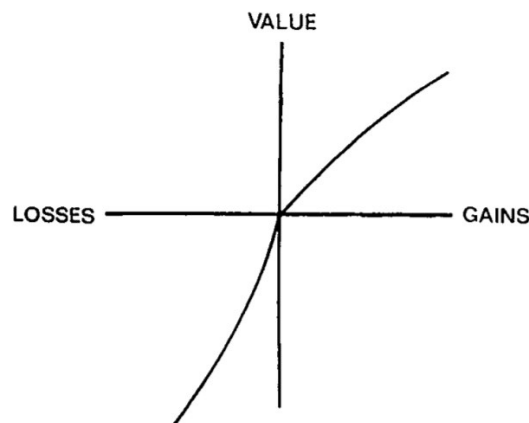


Figure 1.

The value function (Source: Kahneman and Tversky, 1979 pp. 278.)

Often contributed to our loss averse nature is the other strong cognitive bias – the endowment effect. It is described by Ariely [1] as our tendency to value certain objects, services, rights or any valuables higher when they are in our possession



compared to when they are not. This can be attributed to three factors. The first one is that we are able to form an emotional bond to something that belongs to us very quickly and easily. The second, when we decide on a potential transaction, we see much more vividly what we can lose than what we can gain. The third that we tend to believe that the subject of the potential transaction has the same value to the other party than to us.

To test if the endowment effect is observable among the respondents, I have created a group of questions, where the relation of the answers shows whether people decide “rationally”.

In the first two questions, I set up the initial condition of paying HUF 3990 per month for a tariff plan. In the first question, I asked whether the respondent was willing to raise the available mobile data from 200 MB to 400 MB for an additional monthly fee of 1000 HUF. The second question contained a similar offer – raising the free minutes included in the package from 50 to 100 for additional 1000 HUF per month. Based on the answers we should be able conclude whether the additional 200 MB data or 50 free minutes is worth additional 1000 HUF for the respondents. In the third question, I asked the following: *If your current plan includes 400 MB mobile data and 100 free minutes and it costs 4990 HUF per month, are you willing to give up 200 MB data or 50 free minutes to reduce the monthly fee by 1000 HUF.*

We have to realize, that numerically, the third question is equivalent to the first two questions, the only difference is that in the first two questions the respondents were offered something additional, while in the third one they were facing the possibility of losing something. If we predict the results based on rational models, we will come to the conclusion, that those who were not willing to pay the 1000 HUF extra in the first two questions, value the 200 MB extra data and 50 extra free minutes less than 1000 HUF, so they should also be willing to give these up in third question for the offered monthly cost reduction.

Based on what I learned about BE though, I could predict that the respondents will be much less willing to give up what they already have (even if in the thought experiment only). Two third of the people answering my questions were not willing to give up the higher-level services in the third question despite the fact that they were also not willing to pay the extra money for them in the first two questions. This means that they valued the same thing differently when it was their own (or at least described so).

## **Conclusions**

Classic economic theories are built on assumptions about Econs. Econs have a complete and transitive system of preferences, their computational skills are perfect therefore their decisions are rational and consistent. Looking at real world decisions, we have to realize though, that they are not made by Econs, but by

Humans. This does not mean that we are not able to predict the outcome of decisions, but that we need to step out of the classic economic paradigm to make viable predictions. The findings of BE provide a good basis for these different predictions, taking into consideration the seemingly irrational behavior of Humans, pointing to predictable patterns in heuristics, biases and fallacies. We have seen how BE can predict the results of cognitive ease, the preference of stories over statistics and the endowment effect on decisions.

We like to identify ourselves with the capabilities and operating mechanisms of system two, and classic economic theory is also built on this fallacy. We tend to think that our behavior is the result of our conscious decisions, we follow our rational thoughts and we have a more or less complete control on how we make decisions. The results of BE confute these views, and prove how little control we actually have. However, the moral we can learn from this is not that we are doomed to complete unreason and randomness, but that we should give up our idealistic views of the human mind when we analyse decisions and we should incorporate the fallible nature of human beings into our models.

#### References

- [1] Ariely, D., 2010. Predictably Irrational. New York: HarperCollins Publishers
- [2] Berde, É. & Petró, K., 1995. A különféle hasznosságfogalmak szerepe a közgazdaságtanban. *Közgazdasági Szemle*, XLII évf. (5.), pp. 511-529.
- [3] Blume, L. E. & Easley, D., 2007. *Rationality*. [Online] Available at: <http://tuvalu.santafe.edu/~leb/rat03.pdf>
- [4] Gál, R. I. & Szántó, Z., 2003. Cselekvésemélet és társadalomkutatás. Budapest: Közgazdasági Szemle Alapítvány
- [5] Ioannidis, J. P., 2005. Why Most Published Research Findings Are False. *PLoS Med*, 2(8)
- [6] Kahneman, D., 2013. Gyors és lassú gondolkodás. Budapest: HVG Könyvek kiadó
- [7] Kahneman, D. & Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47. (2.), pp. 263-292.
- [8] Kenrick, Douglas T.; Griskevicius, Vladas; Sundie, Jill M.; Li, Norman P.; Li, Yexin Jessica; Neuberg, Steven L., 2009. Deep Rationality: The Evolutionary Economics of Decision Making. *Social Cognition*, 27. (Special Issue), pp. 764-785.
- [9] Sagan, C., 1977. The dragons of Eden: speculations on the evolution of human intelligence. New York: Random House.
- [10] Simon, H., 1955. A Behavioral Model of Rational Choice. *Quarterly Journal of Economics*, 69. pp. 99-118.

- [11] Thaler, R., 1987. Anomalies: The January Effect. *The Journal of Economic Perspectives*, 1. (1.), pp. 197-201.
- [12] Thaler, R., 2016. *Misbehaving: The Making of Behavioral Economics*. New York: W.W. Norton & Company
- [13] Thaler, R. H. & Sunstein, C. R., 2009. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. London: Penguin Books Ltd.
- [14] Velencei, J., Baracskai, Z., 2017 Decision Maker in the Global Village: Thinking Together. in: Bencsik, A., *Knowledge Management Initiatives and Strategies in Small and Medium Enterprises*. Hershey: IGI Global pp. 25-41.