

INVESTMENT THEME

August 2017

We irrational spirits: on man's systematic errors of reasoning

Let's start with a dramatic drumroll: Dear reader, we feel obliged to inform you that, while you may possess the gift of reasoning in your capacity as a representative of the species homo sapiens sapiens, your store of it is much smaller than you think. You are no homo oeconomicus, no fully rational optimiser of benefits who rigorously and at all times weighs up all available information and arrives at sober decisions on the basis of emotionless considerations.

Please don't feel like we are attacking you. Indeed, we might have judged you wrongly: Perhaps you actually are one of the few examples of the human race who can switch off their emotions completely when it comes to making financial decisions. In this case, our apologies.

But for those of you who must regretfully admit that emotions cannot be switched off altogether, we set out below a number of concepts and findings from the sphere of behavioural finance. While we venture to predict that you will not be able to avoid error-free decisions after your reading, we nonetheless hope that you will be able to implement the odd finding in your personal financial sphere of action. Because we are convinced that by so doing, you will be able to avoid the occasional highly unpleasant experience (of an emotional nature) – in keeping with the motto "Know Thyself!", which according to tradition was inscribed above the entrance to the temple of Delphi, the seat of the ancient oracle.

Heuristics

According to Hersh Shefrin, whose book "Beyond Greed and Fear" (published in 1999) may be viewed as the first comprehensive illustration of behavioural finance, a distinction may be made between three key themes: The first of these is that of simplifications ("rules of thumb"), also known as heuristics – the art of arriving at probable statements or practicable solutions, despite having only limited knowledge and little time.

Reference system dependencies

A second thematic area identified by Shefrin is the notion of "frame dependence" or reference system dependencies, i.e. the influence of the presentation of a problem (or its "form") on the decision, in contrast to the objective decision-making parameters (the "content"). To give an example: Let's say a shirt costs 50 Swiss francs in shop A. Precisely the same shirt can also be acquired in shop B, again at a cost of 50 francs, the only difference being that here it is labelled "33% off – was CHF 75". A significant number of people will be influenced by this sign, i.e. they consider the value of the shirt in shop B to be greater, and therefore make their purchase there, even though the content (exactly the same shirt) is no different.

Inefficient markets

The third thematic area can be described using the term "inefficient

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markets". Here the focus is on the repercussions of heuristics and reference system dependencies of market participants for markets and the pricing of tradeable assets, specifically deviations from fundamental values. By contrast, traditional financial theory is based on the assumption of efficient markets (the so-called efficient market hypothesis). This refers to the principle that the price of a security will at all times be aligned with the currently available fundamental information relating to that security. Viewed from this perspective, "bubbles" and "mispricings" simply cannot arise.

Prospect Theory

At the end of the 1970s, the psychologists Daniel Kahneman and Amos Tversky (hereinafter K&T) developed what would become known as "prospect theory". They showed that a large number of behavioural experiments lead to results that call into question the expected utility theory (EUT) – a theory published in the 1940s and still very much in vogue at the time K&T collaborated. Prospect Theory is based on empirical observations of human behaviour, and can be viewed as a realistic alternative to EUT, by virtue of the fact that it includes man's tendency to simplify complex problems through simplifications (heuristics), alongside other factors. In other words, this theory calls into question the assumption – long viewed as valid – that man is (on average) a wholly rational being who maximises his own benefit, acts free of emotions, and makes no errors in the assimilation and processing of information (the definition of the classic homo oeconomicus).

Erroneous appraisal of probabilities

An important point in prospect theory is man's tendency to overestimate low probabilities and underestimate high probabilities. One talks here of man's "probability weighting function": Low (objective) probabilities, i.e. the probability of rolling a 6 three times in succession (just under 0.5% probability, or 6^{-3} expressed mathematically) are assigned a higher subjective probability as a result of this "human" weighting function. Similarly, man seems to typically underestimate high probabilities, in this case the chance of NOT rolling a 6 three times in succession – in other words, assigning it a probability of much less than 99.537%. This is where we bring in the concept of the "certainty effect", identified in this context by K&T but originally coined by the French economist Maurice Allais. In various experiments, K&T showed that the great majority of test subjects do not maximise the expected value (i.e. the value of a lottery as expressed through an aggregation of objectively identifiable probabilities), but appear to have other preferences. They presented the following problem: A choice has to be made between Options A and B. The former involves a lottery with payouts (with the corresponding probabilities expressed in brackets) of CHF 2,500 (33%),

CHF 2,400 (66%), CHF 0 (1%), while B involves a payment with certainty (i.e. 100%) amounting to CHF 2,400. More than 80% of test subjects voted for Option B, even though its expectation value (CHF 2,400) is lower than that of Option A (CHF 2,409). "People" prefer the certain value of Option B, even though the chances of winning nothing is just a single percentage point, i.e. roughly the same probability as rolling a 6 twice in succession and throwing a 5 or 6 with the third throw of the die. The term "certainty effect" is used in this context because we as humans prefer certain events to uncertain ones. Another term of relevance here is "regret aversion": We shape our actions with a view to minimising the risk of regretting something at a later stage, e.g. a loss or indeed a profit we have missed out on. This is a wholly irrational stance to take, because we should be reconciled to the fact that many things are dependent on random chance.

The inconsistency of human decisions in an uncertain situation becomes interesting if the following lottery is additionally considered: Here the choice is between C: CHF 2,500 (33%), 0 (67%) and D: CHF 2,400 (34%) and 0 (66%). In this case more than 80% of test subjects preferred Option C. In itself the choice between C and D is the same as that between A and B, except that in C and D the amount of CHF 2,400 with a probability of 66% has been subtracted from A and B. More than 60% of participants preferred Option B to Option A and preferred Option C to Option D – a clear violation of the rationality assumption, surely?

A good example that can be used to show how low probabilities are more strongly weighted is the following question: You have a choice between G – a win of CHF 6,000 with a probability of 45% – and H, a win of CHF 3,000 with a probability of 90%. Which do you choose? More than 85% of survey participants went for Option H. But if this choice is then illustrated with the following probabilities: Option I: CHF 6,000 with a probability of 0.1% vs. Option J: CHF 3,000 with a probability of 0.2% – would you change your choice? In fact, a clear majority (73%) preferred Option I to Option J. This tallies with other experiments, in which it became apparent that with very low probabilities do people prefer the option with the higher gain.

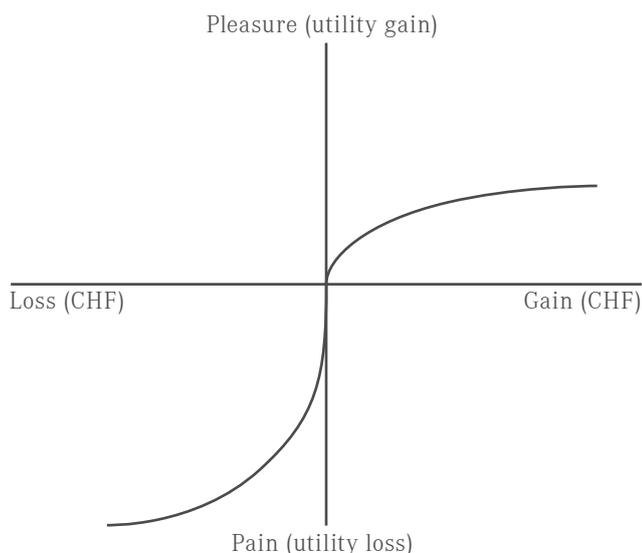
The reflection effect

If one changes the lotteries in such a way that possible gains turn into the threat of losses, human behaviour changes significantly: Risk aversion (in the case of gains, cf. Option A vs. B above) is transformed into a propensity to assume risk in the case of losses. Let's consider Options G and H, with negative values: G' in this case means a loss of CHF 6,000 with a probability of 45%, H' a loss of CHF 3,000 with a probability of 90%. Which do you choose? 92% of test subjects plumped for G'.

Relevant reference point

In other words, we humans make a clear distinction between gains and losses, which is another important finding of Prospect Theory. According to conventional theory, two otherwise identical people (Meier and Huber) would be equally happy with the sum of CHF 1 million. But then suppose that Meier has lost half of his original sum of 2 million within a short space of time, whereas Huber (for whatever reason) has succeeded in doubling his sum to 1 million within the same period. Are they both equally happy today? K&T demonstrated that a person always needs a reference point from which to view possible changes. In the graph below, the reference point is the origin (point at which both axes cross) of the X-Y diagram.

Prospect Theory utility function



Asymmetrical utility function

It immediately becomes clear that the utility function is asymmetrical: On the right-hand side of the original state (the gains) it is concave, i.e. with a falling marginal rate (for each additional gain the additional benefit or "pleasure derived" declines), whereas on the left-hand side (for the "losses") it takes convex form. What's more, it is much steeper on the left than on the right. In other words, a loss of say CHF 1,000 triggers much greater negative emotional repercussions than the corresponding gain of CHF 1,000 is related to positive emotions.

Losers remain in the portfolio

Where investor behaviour in the financial markets is concerned, it may be observed that investors typically sell "winner positions" too

quickly, whereas they hold onto positions in the loss zone in the hope that the loss will decline or possibly even be turned back into a profit, as long as sufficient patience is shown. Let's now use the graph to look at the following situation: One month ago, an investor purchased a share at the price of CHF 100. The share price has now fallen to CHF 90. So the investor has a decision to make: Does he sell today or does he keep hold of the share, even if there is an equal (50:50) chance of the share rising by CHF 10 (back to the original purchase price) or falling a further CHF 10? According to the findings of Prospect Theory, the investor finds himself in the lower half of the graph (i.e. in the loss zone).

Here it has been shown that we humans tend to be risk-loving - the 50:50 lottery is therefore accepted and the share is kept. We ourselves regularly experience situations in which clients are determined not to sell certain positions because the securities in question are trading below their purchase price. From a rational perspective, the only question that should be asked when considering whether to sell or hold a security is whether or not we would again buy the same position today. Only if this question can be answered in the affirmative should the position be held. One way of dealing with this situation is to focus on the fact that the amount invested in the loss position is being "transferred to a new position", rather than bemoaning the realisation of a loss. Seen from this perspective, the realisation of the loss can be contextualized as just a subordinate step in a wider decision (sale and simultaneous purchase of another position).

Cognitive dissonance

We humans have a tendency to try and avoid the unpleasant feelings that arise when our conduct (such as financial decisions) and our critical stance (our self-image as a "good investor" - for otherwise we would not take decisions ourselves in investment matters) are perceived to be contradictory, e.g. when a position has been acquired in the expectation of rising prices, but is now trading at a lower level. The term "cognitive dissonance" was coined in the 1950s, and addresses precisely this issue. As we generally try to avoid unpleasantness we develop strategies to break up this dissonance. We therefore fall back on sham solutions, illusions and excuses, as well as ignoring, denying or dismissing information that contradicts our views. A good example of this would be a smoker confronted with the observation that he is harming himself, who responds by citing a list of people who have reached a ripe old age despite this habit.

Conclusion

In this article, we have, at best, provided only a brief sketch of the area of behavioural economics and behavioural finance, as research has evolved hugely in many areas over the last 40 years. We

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nonetheless hope that you as the reader will be able to take the odd term or aspect away with you. If we have already managed to influence you to the extent of looking at any loss positions in your portfolio in a new light, we will at least have achieved something.

Summary

- We humans are not wholly rational beings.
- By using heuristics ("rules of thumb") we try to break down complex decisions into more comprehensible levels.
- The form how a decision problem is presented has a distinct impact on the decision itself. In this context, psychologists talk of "frame dependence".
- Human behavior differs significantly between potential gains and the threat of losses.

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