

REFERENCE POINT IN OPTIMIZING THE SUBJECTIVE UTILITY OF ECONOMIC DECISIONS

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ABSTRACT

Economic actors use different heuristics to optimize own decision utility under situation of uncertainty. Preferences of the actors to avoid risk or to accept risk are influenced by subjective predictions of outcomes in the form of gains and losses, also by subjective heuristics which are available at the time of deciding for consumption, investment, lending and more. The Reference point is a heuristic, which plays the role of a landmark position for the actors, against which they assess the desired results. In some cases, it is their position, available at the moment of decision, while in others - it is the expected state that potentially could be achieved, taking into account exterior experience and concerning which the actors evaluate the utility of its decision. The conclusion is that it is possible perception of different reference point from actors point of view, given the present and future subjective utility of the decision.

Key words: decision utility, economic risk, economic behavior, utility function

There is no definite answer to the question: is there any human behaviour that is not driven in all cases by some type of subjective utility – either tangible or intangible, in their practically inexhaustible diversity? Describing real life cases where people exhibit behaviour that is freely chosen, i.e. without external coercion (incl. risk behavior) without expecting any subjective utility thereof, is an almost unattainable task.

In his research on perceptions of economic risk Kahneman a. Tversky offer evidence that subjective utility depends not only on objective outcomes, but on the initial objective position of the subject, the decision maker. This objective position determines the extent of gains and losses as a result of the decision made (Kahneman, in McManus, 2004).

They experimentally found that when making a decision in a situation of uncertainty, people evaluate their future income not in absolute terms, but by comparing them with their current level or with a relative value, a reference point, accepted as basis (after Gupta a. Murray, 2005). In other words, there is relevant dependence of gains and losses to a known reference point (current state at the time of decision making). Thus, for financial decisions objective gains and losses are the main carriers of utility, but commensurate with that reference point. It is to it that people perceive and evaluate various parameters of the choice as subjectively favorable or unfavorable (Gupta a. Murray, 2005). When doing that they also take into account the probability of reaching the goal.

Gupta a. Murray (2005) discuss the issue of reference point in investment decisions. According to them investment subjective utility is an evaluation for achieving future welfare at a particular time horizon, with a significant probability for attaining a particular target level of welfare, regarded by the authors as an "objective." Decision makers have a rough idea of their objective and consider the target level of welfare by taking into account the total subjective and objective expenses they have to make. Gupta a. Murray (2005) look for relationships between the optimal investment decision and the financial potential of the decision-maker during the scheduled period, without necessarily referring to the properties of the objective utility. Making long-term investment decisions is discussed from the perspective of a more general understanding of utility in comparison with the knowledge about the axioms of choice stipulated in the regulatory theory. They seek the difference between behavioural and regulatory utility in the preferences of decision-makers. Their test results show the dependence of the investment strategy on the current level of welfare. Both with very high and very low levels of overall welfare subjective utility based on the reference point, recommends an investment strategy with full investment in risky assets for any

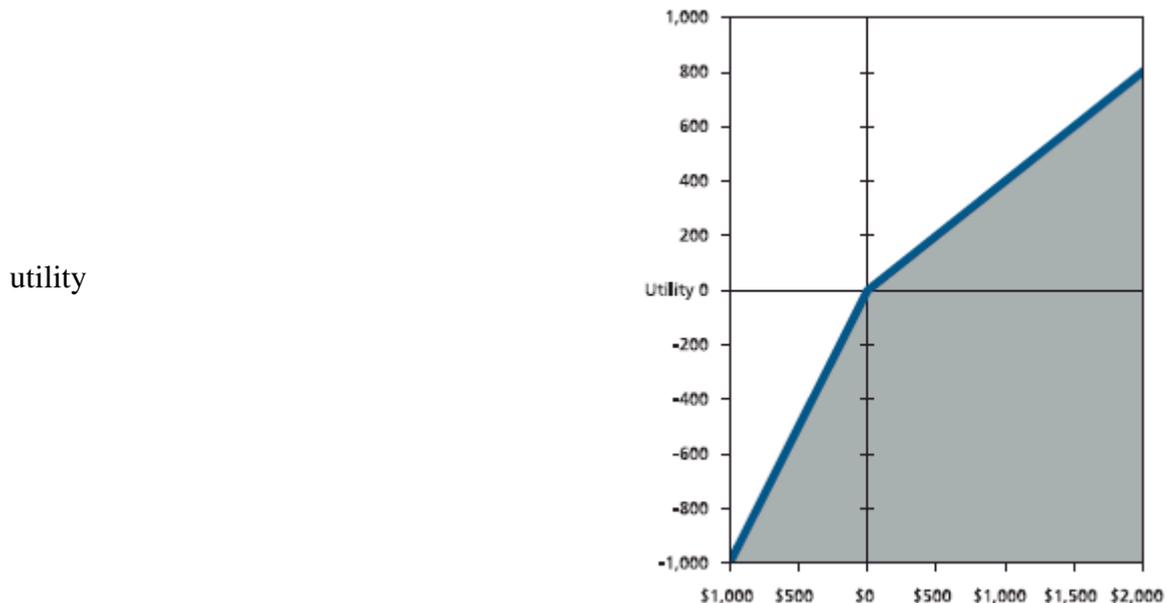
period of time. At an average level of welfare, however, it is advisable to divert full capital investment in risky assets. This middle range of welfare in which the investment has to be in non-risk assets, is modified with the reference point of utility.

Specific in Kahneman (2004) is that he interprets the reference point as neutral result as well – welfare is preserved, but neither gains nor losses are achieved.

In Fig. 1 he presents in summary form the results from many years of research on how people evaluate gains and losses. According to this graph, the utility function is set to 0 in two cases: "most frequently with neutral result, the so-called reference point (reference point), equal to the current welfare, more rarely it conforms to the result that the individual has a reason to expect because sometimes other people get it "(Kahneman, 2004). For Kahneman the reference point is a reference condition to which the decision-making entity correlates the expected results. In some cases, it is his condition available at the moment of decision-making, in others - the expected condition that can potentially be achieved, taking into account third-party experience and in regard to which the perpetrator evaluates the utility of his decision.

The characteristics of the utility function presented on Fig. 1 allow two conclusions important for the explanation of many decisions in situations of uncertainty (Kahneman, 2004): 1.) As a whole, for people the pattern of "loss aversion" is typical, thus the losses function is steeper than that of the gains. This psychological fact is designated by the author as the "disposition effect" 2.) Rough proportionality of attitudes towards risk and gains and losses is established which is proved by the specific mathematical relations describing both function limbs.

Fig. 1 Utility function (after Empirical results by Tversky and Kahneman, 1992)



In proof of the second conclusion, Kahneman (2004) uses the results from an article by Benartzi a. Thaler (1995) who studied the influence of loss aversion on the valuation of shares and bonds. They found that for the previous year, profits from shares were 7 times greater than the profits from bonds. However, the market for both types of assets is approximately balanced. The researchers' explanation is that when calculating objective benefits, perpetrators never miss the other fact - the objective probability of loss on shares is much higher. This makes bonds more attractive as being safer, albeit less profitable assets. Based on such studies Benartzi a. Thaler formulate the thesis of approximate proportionality of risk attitudes: when the possible outcomes of the perspective (author's note possible gains and losses) increase within small ranges, their cash

equivalent (author's note money that agents intend to invest as a result of risk decision) changes in almost the same intervals.

Kahneman (2004) discuss the purchase price of shares as a reference point in investment decisions. When they decide to sell shares, investors evaluate gains or losses as to that price. It is assumed that with their actual investments in shares investors will continue to use steadily this price as a reference guide when estimating future outcomes. Thus, the initial price determines whether the sale of shares at a specified time will bring profit or loss (Kahneman, 2004). When studying the business records of 10 000 different investors, Odean (1998) found that they were much more likely to sell shares when their price goes up and this will guarantee a safe profit. Thus they demonstrate market resistance to implementation of losses (Kahneman, 2004).

Kahneman (after McManus, 2004) reviews the correlation of utility with the reference point in consumer behavior. He poses the question whether consumer behavior depends on the degree of utility in consumption of a greater or lesser quantity of goods. Despite the existing cultural and systemic differences in thinking about individually attractive alternatives, experimental results show that consumers are willing to change their behavior (increase consumption) if the consumption of a greater amount adds utility compared to consumption of a lesser quantity. This is not observed when total utility cannot be increased by any amount in excess, and marginal utility resulting from consumption of a greater quantity is equal to it. Those consumption models that lack any reference to the original utility that consumers already have, are life ineffective.

In support of these statements we can give examples familiar to most people in their daily lives. Widespread in Bulgaria are the trading strategies aiming at changing consumer behavior. Their overall plan is to encourage consumer choice by offering the opportunity to purchase kits (packages) of various commodities in the price of a single constituent items. Psychological strategy relies on the usefulness of a priority item in the package (eg household appliances), which can be purchased bundled with other (eg, household utensils), the total package price is the value of the priority range. Ie to obtain a useful object, the user must purchase and other consumer whose utility is unknown in advance and it is doubtful as the buyer and the commercial agent. According to expert opinions to such proposals orient users who preferred to other of articles offered in the package (thus increasing the overall utility), but rarely those who have a preference to only one of them, especially if its unit value is greater than the value of the whole package offered. In the latter case the utility does not increase the consumption

Their overall plan is to encourage consumer choice by offering opportunities to purchase kits (packages) of various commodities at the price of a single constituent item. Psychologically the strategy relies on the usefulness of a priority item in the package (e.g. household appliance), which can be purchased bundled with other (e.g. other household utensils), the total package price is the value of the priority range. I.e. to obtain a useful object, the user must purchase others, the utility of which is unknown in advance and therefore it is doubtful both for the buyer and the commercial agent. According to expert opinions such proposals are attractive for users with preferences to the other items offered in the package (thus increasing the overall utility), but rarely ones who have preferences to only one of them, especially if its unit value is not greater than the value of the whole package offered. In the latter case overall utility does not increase with the consumption of more different goods.

In this sense, Kahneman has reason to argue that the preferences of actors to risk-avoiding behavior, accepting and seeking risk are influenced not only by their subjective assumptions but about the final results in the form of perceptions about gains and losses, and also by the available position of decision-makers at the time of its formation.

The classic example given by Kahneman to demonstrate that thesis is the following: We have two people, both receive their quarterly statements about their shares and securities. One of them learns that his wealth has increased from 1 to 2 million, and the other - that his wealth has reduced from 4 to 3.5 million (after Ackman, 2002). If the starting point of analysis is the actual momentary

well-being, then obviously the second one is better off. If the starting points are profit or loss, then it is clear that the first one will be happier because he had won, the second - unhappy because they had lost. According to the opinion of Kahneman himself, this is one of the key insights in the theory of perspective (Ackman, 2002).

In practice, the initial utility is a relative reference point for the selection from a more distant perspective. For example, equal probability (50%) for profit or a loss of \$ 100 when \$ 100 are available caused most often risk-avoiding behavior, while equal probability of winning or losing \$ 100 when \$ 1,000,000 are available may provoke risk-seeking behavior (Kahneman, after McManus, 2004). In the first case with an adverse outcome the risk undertaking entity may lose all their available funds, while in the second – he may lose a small amount from the point of view of the funds available which changes the perception of the magnitude of loss and thus determines the different behavioral risk tendency (Kahneman, after McManus, 2004).

The conclusion from the experiments discussed is that from the point of view of the actors perception of different reference point is possible given the present and future utility. To verify hypotheses on the subjective perception of current status (current well-being) as a reference point against which people "count" their benefits and losses and as a result undertake risk-taking or risk-avoiding behavior, a research was conducted among 230 students - full and part-time training in economic majors at Trakia University. In their professional status some of the part-time students work as economists, others have non-economic jobs, and still others are unemployed. The objective is to analyze the possible economic behavior in various objectively small values of the available risk resource. Respondents had to answer the question: "In which cases would you use all your cash in a lottery game, if you know that you will get cash next in a week's time?". In this research situation, research respondents have to solve the problem in three hypothetical cases: if their last cash is 0.50 lev, 2 lev and 10 lev and they are able to substantiate any of their decisions. These are the amounts they would lose in an adverse outcome. The aggregated results show that 13,05% of respondents would risk their last available 0.50 lev, 13,02% - 2 lev available to them, and 26,07% - 10 lev available to them, and 47,83% would not have risked their money in any of the three cases. That is, about 50% of students would put their currently available resources in sweepstakes and it is that group that is of interest in the interpretation of the mechanism of determining the reference point against which any gains and losses are measured. The arguments of the respondents from the first two groups (having risked an amount of 0.50 lev and 2 lev) are generally in the direction of allegations that the amount available is too small and cannot even solve the minimum necessities of life under normal non-extreme situations. These results allow some adjustments in the theoretical hypotheses of Kahneman a. Tversky discussed above. It can be assumed that not only the magnitude of the wealth available at the time of decision-making, but rather its subjective situational utility should determine the choice and judgment in risky situations. When the available resource is negligible, its usefulness from the point of view welfare, which it comprises, will be subjectively judged as insignificant. Furthermore, the descriptors of respondents indicate that they move according to the ratio between subjective utility of current welfare and subjectively determined minimum adequate welfare ("With 0.50 lev I cannot do anything, with or without them nothing will change"). Actually, it is possible for a change of reference point to be taking place. That is, not the available status, but the minimum sufficient status that would solve the current situational problem – the cause for the risky action, will form the level of subjective utility, which in this case is perceived by the respondent as a reference point. Namely because of that, the very low level of welfare can determine the risk-taking behaviour – a conclusion reached by Gupta a. Murray (2005).

The second group (that risked an amount of 10 lev) justify their decision by subjective perceptions and expectations of increased probability of winning at a higher stake (descriptor: "When I play with a larger amount, the chances to win are bigger"). Therefore, the usefulness of the decision is determined not only by the magnitude of the reference point as current status, but by the

minimum required value of the resource available at the moment of decision-making, and the usefulness of the possible gain. That is, there is a tendency of perceiving a different reference point depending on ratio of current utility of welfare and future utility of the result.

The dispersion analysis of empirical data by subgroups points to deriving the following trends:

- risk-taking behavior would be adopted by the respondents in group A, for who the amount theoretically regarded as current status is the highest (10 lev). They can be characterized as: trusting their intuition ($F = 15,39$, $p < 0,001$); making their important decisions more often after consulting other people from their close circles or with experts ($F = 4,53$, $p < 0,05$), defining the decisions with shared responsibility as involving greater risk ($F = 16,35$, $p < 0,001$) and having non-coherence of choices in shaping the alternatives as gains or losses ($F = 14,50$, $p < 0,001$);

- risk-taking behavior would have been pursued by the respondents in Group B, in whom the amounts reviewed as current status are small (0.50 lev and 2 lev). They do not tend to trust their intuition; make primarily independent decisions, assess as more risky the decisions related to personal responsibility for the consequences and show significantly more coherent choices in a different formulation of single alternatives as gains or losses;

- respondents avoiding risk in the three experimental situations share the characteristic of group B, except that they show less coherence of choices in differently formulated alternatives.

American researchers observed a similar phenomenon of change of the reference point in the behavior of clients in restaurants (giving tips to waiters). Clients give greater tip at a smaller bill in the restaurant (Chapman a. Winqvist, 1998). Confirmation of their observations is found in the behavior of Bulgarian clients. If the bill (e.g. 150 lev) is significantly less than the amount that the client is ready to pay at the restaurant (e.g. 200 lev perceived as a relative reference point), he will be prone to a greater tip (e.g. 15 lev) since he will compare to the total value of his expenditure (the bill plus the tip - 165 lev) to the amount he is generally ready to spend at the restaurant (200 lev). If the bill he owes is high (e.g. 190 lev), he would be prone to a smaller tip (e.g. 10 lev) because his overall expense at the restaurant (the bill plus the tip - 200 lev) will tend to or use up the predetermined amount of the client (200 lev perceived as reference point). In this case, the subjectively determined purchase price for the service of 200 lev that the client is prepared to pay can be seen as a reference point against which the subjective significance of the value of the tip, seen as discount in value, is assessed. In the first case the amount of the tip has less subjective significance, although nominally higher, while in the second - more subjective significance at less nominal value compared to the purchase price of the service as a reference point.

Kahneman (after McManus, 2004) gives a number of examples which show that people are willing to make efforts to save a single amount of money (e.g., queuing all night in front of the department store to buy a coat sale, thus saving 400 pounds) instead saving regularly the same amount of money employing a more rational approach (e.g. they are not ready to make a single investment of 1000 pounds for improving the insulation of their house that would periodically save them 400 pounds). The saved amount is exactly the same but the approach is completely different (Kahneman, after McManus, 2004). The choice depends on perceptions of sustainability of the reference point against which actors assess the usefulness of the alternative and on the orientation to delayed/instant consumption.

In the described cases the new situation after acquisition of extra utility became a reference point against which benefits and losses are assessed retrospectively. This phenomenon corresponds to certain features of social perception, according to which desirable outcomes (in this case the additional utility gained) are fixed in the mind faster than the undesirable ones. This practically changes the reference point for subjective assessment of gains and losses.

Conclusion: not only the magnitude of the wealth available at the time of decision-making, but rather its subjective situational utility should determine the choice and judgment in risky

situations. Also it is possible a change of reference point. Sometimes that is, not the available status, but the minimum sufficient status that would solve the current situational problem – the cause for the risky action, will form the level of subjective utility, which in this case is perceived by the actors as a reference point.

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