Ambiguity Effect

Classification

The ambiguity effect can be classified as a cognitive bias. Generally, cognitive biases describe a person's tendency to make errors in judgment based on cognitive factors.[1] There are a lot of reasons why people develop cognitive biases, e.g. these biases help the brain to process information quickly even when that processing is sometimes erroneous.[2] To be more precisely the ambiguity effect belongs to the class of biases in probability and belief; these biases are often studied for their influence on business and economic decisions and on experimental research.

Definition

The central statement of the ambiguity effect is that people prefer to choose an option with a known probability of a favourable outcome over an option where this probability is unknown. Thus, their decision making is affected by a lack of information, or "ambiguity" (missing information makes the probability seem “unknown”). Since the majority of people do not like risk, this unknown probability increase their uncertainty and they therefore prefer a known probability (even if it is low) over an unknown one.[3]

Examples

The first one to describe the ambiguity effect was Daniel Ellsberg in 1961. He presented the following experiment (which became known as the Ellsberg paradox) in order to illustrate the implications of the effect:

Consider a bucket containing 90 balls. The balls are coloured red, black and yellow. Thirty of the balls are red, and the remaining 60 are some combination of black and yellow, with all combinations of black and yellow being equally likely.

Consider at first the following decision problem. In option A, drawing a red ball wins a person 1000€, and in option B, drawing a black ball wins them 1000€. Most people prefer in this situation option A since the probability of drawing a red ball is known (1/3). The number of black balls might be larger than this of red balls but since the actual number is unknown most people dislike the additional uncertainty. Thus, we can see that the ambiguity effect holds.

A second possibility would be to choose between the following options: Now, in option A, drawing a red or a yellow ball wins a person 1000€, and in option B, drawing a black or a yellow ball wins them 1000€. Here again, most people tend to select the option where the probability is known, namely option B with probability of 2/3 and thus we again can confirm the ambiguity effect.

However, the Ellsberg-Paradox implies that this effect violates the axiom of independence if people behave in the way described above. Since according to this axiom the additional lottery of drawing a yellow ball in the second example must not lead to a change in preferences, i.e. if someone chooses option A in the first example he must also choose option A in the second example otherwise the axiom of independence would not hold.[4]

Another example for the ambiguity effect could be the following one: I know that there is at best a moderate chance of my winning a local singing competition as the local singers are good. There is a competition in the next town but I do not know how good the singers are there. Rather than ”risk it” I just enter for the local competition.[5]

Sources:

[1] *http://en.wikipedia.org/wiki/Cognitive_bias*
[2] *http://www.wisegeek.com/what-is-a-cognitive-bias.htm*
[3] *http://en.wikipedia.org/wiki/Ambiguity_effect*
[4] *Ellsberg, D. (1961). Risk, ambiguity, and the Savage axioms. Quarterly Journal of Economics, 75, 643–699.*
http://en.wikipedia.org/wiki/Ellsberg_paradox
http://en.wikipedia.org/wiki/Ambiguity_effect
[5] *http://changingminds.org/explanations/theories/ambiguity_effect.htm*