Behavioural Economics

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BEHAVIOURAL ECONOMICS

Behavioural economics (BE) is an integration of psychology into economics. It is a growing field that has entered mainstream economics. This is a rather new development. For decades economics was mostly separated from the other social sciences. This was not always so. From Adam Smith to John M. Keynes, economists regularly used psychological arguments in their economic explanations. In post-war economics, theorists aimed at developing a pure economic theory based on methodological individualism and without any recourse to psychological or sociological ideas. This approach has led to an impressive development of economic theory in numerous areas of economics. The main advantage is that it provides economists with a unified (formal) language and conceptual framework for undertaking economic analysis. This also holds for BE. BE would probably not exist in its present form without the great advances of modern economic theory. The goal of BE is not to disprove economic theory, but to improve economic analysis by resting it on psychologically plausible assumptions about economic behaviour.

The progress of BE is to a large degree due to (1) pinpointing problems in basic economic assumptions by providing empirical evidence from the field and tightly controlled laboratory experiments; and (2) new theoretical developments. I will therefore structure my discussion along the canonical economic model. Elements of it can be found in almost all economic models. In this model, agents are modelled as decision-makers who maximize their (discounted stream of future) utility, given their constraints and their information about uncertain events. To make it workable, the following assumptions have been typically made:

1. **Selfishness**: the agent only cares about his or her own consumption.
2. **Expected utility maximization**: the agent’s preferences over risky choice alternatives obey the axioms of expected utility theory.
3. **Exponential discounting**: future utilities are discounted at a constant rate.
4. **Bayesian rationality**: information processing and probability judgements obey the probability axioms and Bayes’ rule.
5. **Maximization**: agents optimize.

Research in BE has attacked all assumptions. The remainder of this article looks at these five topics. In addition to field studies, tightly controlled, and often replicated laboratory experiments, where participants are paid according to their decisions, have been very instrumental for BE.

My approach will be necessarily selective. Camerer et al. (2004) is a useful comprehensive reader on seminal contributions to the field of BE.
**Social preferences**

In contrast to the often-made assumption of selfishness, many people take the well-being of others into account in their decision-making. Experiments have unambiguously established this fact, by showing that many people are motivated by fairness and reciprocity. The results have also led to new theoretical developments (e.g. Fehr and Schmidt 1999).

A highly influential game has been the ultimatum game. This is a two-person game, where player 1 is endowed with €10. He has to make a proposal $0 \leq y \leq 10$ to player 2, who can only reject or accept the offer. If she accepts, she gets $y$ and player 1 gets $10 - y$. If she rejects, both get nothing. A selfish player 2 should accept everything and therefore player 1 should offer the smallest money unit. Yet this is not what typically happens. Participants in the role of player 2 tend to reject offers below 50 per cent with an increasing probability the lower the offer is. Player 1s typically make offers of 40 to 50 per cent. This result has been replicated hundreds of times and in different cultures.

The behaviour of player 2s in the ultimatum game illustrates ‘negative reciprocity’. People are often willing to forgo money in order to punish behaviour that is perceived as unfair. Negative reciprocity can also be observed in other games: for instance, in cooperation games that permit punishment cooperators typically punish the defectors. There is also substantial evidence from various games for ‘positive reciprocity’, i.e. people are willing to reward behaviour that is perceived as kind.

These results are important for understanding a variety of economic issues, like wage formation, the provision of incentives and limits to free riding (Fehr and Gächter 2000).

**Loss aversion and reference-dependent (risk) preferences**

The dominant theory of behaviour under risk is expected utility theory. Yet, very early on, experiments have demonstrated violations even in very simple lotteries. Kahneman and Tversky (1979) found that people evaluate changes in wealth rather than absolute wealth. Choices depend on a reference point, which defines gains and losses. Many people are loss averse. Loss aversion means that people dislike losses more than they enjoy equal-sized gains. This leads to risk aversion in the gain domain and risk seeking in the loss domain. Prospect theory formally models these observations and further assumes that people weigh probabilities non-linearly, overweighting small probabilities and underweighting mid-range probabilities.

Prospect theory is a prime example for BE, because it is based on careful experimentation. It is meant to be a descriptive, psychologically based theory of behaviour under risk. It has been highly influential in many fields.

Loss aversion is not restricted to risky choices. It can explain, for instance, why there is a status quo bias in many decisions.

**Hyperbolic discounting**

Many decisions concern future gains or losses. According to the dominant model, people discount future utilities at a constant discount rate, i.e. the discount rate is independent of the time delay. If someone prefers €100 today over €120 in one year, he or she should also prefer €100 over €120 if these amounts are due in one and two years, respectively. Yet, in contrast to this, many people experience a preference reversal as time passes. People are impatient in the short run and prefer €100 today over €120 one year hence. But when €100 is due in one year and €120 in two years, people are willing to wait another year to
A large body of evidence supports the conclusion that people are impatient in the short run and patient in the long run (Frederick et al. 2002). This pattern of discounting is called ‘hyperbolic discounting’.

The observation that many people’s long-run intentions and their short-run actions are in conflict has profound implications. It leads people to save too little for their retirement, because the short-run gratification of immediate consumption overrides the long-run benefits of a better pension provision. Similarly, people often intend to lead a healthier life, but short-run temptations often undermine the good intentions. This divergence creates a demand for commitment. For instance, people save in illiquid assets and the state forces people to save for retirement by automatically deducting the pension contributions from their wages.

**Heuristics and biases**

Many economic decisions require the judgement of probabilities. In standard economic models people process probabilistic information according to the probability axioms and Bayes’ law. Yet, as the hugely influential ‘heuristics and biases’ approach by Tversky and Kahneman (1974) has shown, people often use heuristics, i.e. decision short-cuts and rules of thumb, to make judgements. While heuristics are generally useful, they can sometimes lead people astray.

One important short-cut in making judgements is the ‘representativeness heuristic’. For instance, when people have to judge the probability that event X belongs to set Y they often make their judgement on the basis of how similar X is to the stereotype of Y and thereby disregard the a priori probability of X. If someone looks like a librarian, people overestimate the likelihood that he or she actually is a librarian because they ignore the fact that only a small fraction of the population are librarians. For a similar reason people tend to overgeneralize from small samples.

Another useful heuristic is ‘anchoring’. A quantity is estimated by starting from a salient anchor and then adjusted in the appropriate direction. Yet adjustments are typically insufficient. For instance, when people are asked to estimate the confidence interval of the Dow Jones index on some particular date in the future, they take the current value as an anchor and adjust their estimates up and down. Typically this leads to much too narrow confidence intervals, i.e. people’s judgement displays ‘over-confidence’. This phenomenon and observations on related heuristics and biases have sparked a lot of research in behavioural finance. For instance, overconfidence can explain ‘excessive trading’ observed in financial markets.

**Bounded rationality**

Taken literally, the canonical model assumes that people maximize the utility function outlined above, using the tools of optimization theory. Herbert Simon, who pioneered research on bounded rationality, was the first to point out the implausibility of optimization. Instead of general-purpose algorithm like optimization, people use domain-specific heuristics from an ‘adaptive toolbox’ (Gigerenzer and Selten 2001). This toolbox comprises search rules, stopping rules and decision rules. Search rules describe how to search for alternatives and how to evaluate them. Stopping rules describe when to stop the search. For instance, the search may be stopped after an alternative has met a certain aspiration level. Once the search has stopped a decision rule describes how a decision or inference is made.

Research in this field has made a lot of progress. It turned out that rather simple heuristics, like ‘Take the Best’, which only looks for a few cues and then takes the best
alternative, are quite successful and beat more complicated rules that take more information into account. This will surely be a fertile area of research in the years to come.

**Conclusion**

Making progress in science often requires a dual process of ‘destruction’ and ‘reconstruction’. Understanding the validity and scope of assumptions with the help of careful experimentation and interdisciplinary research (most recently in neuroscience) is one thing; being able to better explain core economic phenomena is another one. BE has made progress on this ‘reconstructive’ front as well. First, research in BE has led to theoretical alternatives to the standard assumptions outlined above. Prospect theory, hyperbolic discounting and models of social preferences are prime examples. Second, inspired by the new theories, empirical researchers have taken fresh looks on well-known phenomena in many subfields of economics. Research on social preferences, learning and heuristics has led to a field called ‘behavioural game theory’ (Camerer 2003), which aims at explaining human strategic behaviour. The field of ‘behavioural macroeconomics’ is influenced by research on consumption and savings decisions, but also by the insight that fairness, for instance, might contribute to the phenomenon of wage rigidity, which is a long-standing macroeconomic issue. Prospect theory and the ‘heuristics and biases’ programme have helped forming the field of ‘behavioural finance’, but have also influenced decision sciences and created the field of ‘behavioural law and economics’. The interested reader should consult Camerer et al. (2004), which contains many interesting applications. And many more applications are sure to come.

**References and further reading**


