Why Behavioural Economics Will Not Save the World

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Behavioural economics is widely considered to be a significant break from standard economic modelling. What is different about the behavioural economics approach? Is it as revolutionary as we are led to believe? What else does research in this field offer?

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The award of this year's Nobel Memorial Prize in Economic Sciences to Richard Thaler has brought renewed attention to the field of behavioural economics.[1] Four earlier Nobels have been given to scholars who have integrated insights about human behaviour from psychology into economics: Herbert A Simon (1978), Maurice Allais (1988), Daniel Kahneman (2002) and Robert Shiller, Eugene F Fama and Lars Peter Hansen (2013). This shows that there is a recognition within the discipline of the contribution that the behavioural approach has made to the understanding of economic phenomena. However, the extent of this contribution is often exaggerated, and behavioural economics is presented as the panacea that will cure economics of all its problems.

In this article, I describe how the behavioural approach is different from standard economic models and then argue that, while the shortcomings of the standard models pointed out by this approach are important, the models that are offered as alternatives do not depart from the standard ones in any fundamental way. Many of the problems with these models that came to light in the aftermath of the 2008 financial crisis indicate a need for a much more radical change in the way economic theory is done. I end by highlighting one approach that has the potential to bring about this change.

Standard Model

To understand how the behavioural approach is different, let me first put down the basic framework in which standard (I will use "standard" instead of the more loaded term "neo-classical") economic models are constructed. This framework is called "rational choice" and it assumes that individuals have preferences over all possible alternatives, and that they take actions within certain "constraints" (these could be financial constraints or time constraints) to choose the most preferred alternative possible.[2]

Preferences are assumed to be rational, implying that they satisfy some assumptions like "completeness," which says that every possible outcome is included in the ordering of preferences, and "consistency," among others. These assumptions are not based on observed behaviour but are axiomatic in nature, which means that they are assumed to be true within the model. The argument for using axiomatic assumptions is that if the model's predictions are close to reality, then it shows that people behave as if they have such preferences, and that is good enough for the purpose of economic analysis.

Under such assumptions, the preferences can be depicted by a function that maps each outcome, whether it is wealth or a state of the world, on to a number, with a higher number indicating a more preferred outcome. This number is called "utility" and the mapping function is called the "utility function." The entire process of choosing the most preferred alternative within the given constraints can then mathematically be modelled as a constrained maximisation of the utility function.

Behavioural Approach

The behavioural approach departs from this standard model by pointing out situations where models built on these axiomatic assumptions fail to predict reality and, hence, makes a case for using a behavioural basis for constructing economic models. This is, perhaps, best understood by looking at the anatomy of a typical research paper that uses this approach. The paper generally begins with a critique. It presents data, experimental or otherwise, to show that the predictions of the standard model of economic decision-making are violated systematically, that is, the deviations from the predictions do not reflect just random noise, but show a consistent departure from the model in one particular direction.

A good example of this comes from one of the first papers to use this approach by Kahneman and Tversky (1979).

A group of experimental subjects is given 1,000 units each, and each of them is then asked to choose between two options:

(A) Get another 1,000 with 50% probability.

(B) Get another 500 for sure.

It was found that 84% of the subjects chose option B.

Another similar group is given 2,000 units each and is given the following choice:

(C) Lose 1,000 with 50% probability.

(D) Lose 500 for sure.

Sixty-nine percent of the group chose option C.

As is clear from doing a little arithmetic, the end results of options A and C, and those of options B and D, are identical. Yet, people systematically choose to treat them differently. This demonstrates two behavioural phenomena called reference dependence and loss aversion. The standard model has no way of explaining this behaviour, as people are only concerned with the final outcome.

This and other such anomalies are not just academic curiosities as they have important implications for how we think about people taking economic decisions. For example, loss aversion will play an important role in a person's investment in risky assets, where there is a chance of making a loss. Hence, the second part of most papers taking this approach presents an alternative model that explains such anomalous behaviour.

Typically, these models continue to use the constrained optimisation approach of the standard model while modifying one or more assumptions that take the form of additional parameters in the mathematical formulation of the model. The values of these parameters are then determined using experimental observations, thus yielding a model that fits observed behaviour much better than the standard model.

In this particular case, the authors replace the utility function with what they call a value function. Instead of mapping outcomes, that is, wealth, on to a number, this function maps gains or losses on to a number. This incorporates reference dependence. Also, the function is kinked at zero, so that it falls faster with losses than it rises with gains. This incorporates loss aversion. In a subsequent paper, Tversky and Kahneman (1992) estimate this loss aversion to be 2.25, that is, the reduction in value because of a loss is 2.25 times more than the increase in value because of a gain of the same magnitude.

A similar pattern is seen in most areas where the behavioural approach has had an impact. For example, there is a large body of literature pointing out that, while preferences in the standard models typically reflect only the individual's own wealth or consumption, people actually care about fairness and equity and are altruistic (Thaler 1988; Fehr and Gächter 2000).

Models that incorporate these behaviours (Fehr and Schmidt 2004) just modify the utility function to reflect social preferences, that is, to include others' consumption, or to explicitly include a disutility caused by inequality. Here, as in the previous case, the changes are minor, and constrained optimisation continues to be the underlying framework.[3]

Behavioural Non-revolution

Finance is one of the fields where behavioural models have been used extensively, enough for "behavioural finance" to become a commonly used term. Behavioural models in finance most often critique the efficient market hypothesis, which states that if investors behave rationally then prices should reflect all available information about the financial asset in consideration. But, asset price bubbles and crashes belie this conclusion. A number of behavioural models, including feedback models where investors bid up the price on seeing other investors bidding up the price, have been used to explain these phenomena. This idea of "irrational exuberance" is now widely accepted and used in financial analysis, especially while analysing asset price bubbles. Shiller's and, to some extent, Thaler's Nobel prizes were largely due to their contributions in this area.

While bubbles do occur in asset markets, for the most part, asset prices are such that it is hard for any investor to beat the market consistently. This implies that even when agents are "behavioural," that is, they act not as assumed in the standard model, but in a loss-averse and reference-dependent manner, described earlier, they interact with each other to produce outcomes as if they were all behaving rationally. This is a common critique of the behavioural approach, which says that while there are anomalies, for the most part, market outcomes are as predicted by the standard model. Behaviours like reference dependence should lead to "money pumps" which firms can exploit to continuously extract surplus from individuals. But, such money pumps are not found in the real world (Bryan 2017). This is not so much a critique of the behavioural approach, as much as an explanation for why the standard models are still widely used in economics.

As explained earlier, the behavioural approach does not depart from the standard models in any fundamental manner. Behavioural models are most often extensions of standard models, which enable them to explain certain anomalous behaviours are not explained by the standard models. But, these unexplained behaviours are the exception and not the norm and, hence, the original standard models continue to be used widely. To expect an approach that makes such piecemeal changes to the standard to revolutionise the discipline in a fundamental way is a misplaced expectation to begin with.

But, this is not to say that there are no problems with the way standard economic models are constructed and used. Many of these problems were foregrounded in the aftermath of the 2008 financial crises. These problems attain even more significance when these models of individual behaviour are aggregated up to micro-founded macroeconomic models and are used in macroeconomic policymaking.[4] Non-behavioural assumptions are part of the problem, but there are many other issues too.

Individuals form the basis of such models and individual preferences are assumed to be given, divorced from any societal context, thus disregarding channels through which the society affects individual behaviour by changing individual motivations. While aggregating individuals' behaviour, very often all individuals are assumed to be homogeneous, using what is called the "representative agent" assumption. This is most often done for mathematical tractability, but by doing this the model fails to incorporate phenomena that could emerge because of interactions between heterogeneous agents. And, finally, the idea of equilibrium is a key feature of standard economic analysis, whereas most of the time the economy is out of equilibrium. It may be the case that studying equilibrium conditions is not very useful for explaining non-equilibrium situations.

None of these issues are addressed by the behavioural approach, rather they continue to be true of most behavioural models. In recent years, some alternative approaches have emerged that could potentially address some or all of these issues. One such approach seeks to continue the work started by Simon.[5]

Computational Approach

Simon was one of the first persons to bring insights from psychology into economics. He questioned the reliance on constrained optimisation as a model for decision-making by pointing out that the processes of finding alternatives as well as of computing the optimal one are both costly. Simon (1972) described decision-making under these constraints as "bounded rationality" and argued that, instead of modelling individuals as maximising utility, it is better to think of them as using simpler heuristics that enable them to meet a minimum aspiration level. He made substantial progress in simulating such decision-making behaviour using computers and, along with the economics Nobel, he was also awarded the Turing Award prize, one of the highest honours in computer science.

Simon's insights are being operationalised today by a computational method called Agent-based Modelling,[6] which models the economy as a complex system consisting of heterogeneous individuals who interact with each other and are embedded in a social network that in turn affects each individual's behaviour. Each agent behaves according to some simple heuristic, and aggregate outcomes emerge from the complex interactions between these agents. As computers are used to simulate these interactions, mathematical tractability is not a concern and, hence, there is no need for simplifying assumptions such as representative agents.

It is in such models that the insights of behavioural economics could end up having a greater impact, as they could (and do) inform the assumptions about how these agents behave and interact with each other within these simulations, some of which have grown large and complex enough to mimic the size of actual economies (Axtell 2016). This is not to claim that the computational approach or complexity economics will "save the world," but to point out that there is a need and an opportunity today to explore multiple approaches to economics, with an open mind, in order to take the discipline forward.

NOTES

1 The term "behavioural economics" itself is somewhat of a misnomer as it does not form a distinct subfield like financial economics or labour economics, and is rather just a modelling approach that modifies the existing neoclassical economic models used in these subfields by bringing in psychological insights about human behaviour.

2 Beliefs also play an important role, but we will ignore that for the present discussion.

3 The same is the case with models dealing with uncertainty (prospect theory), or inter-temporal choice (hyperbolic discounting). For a detailed survey of behavioural models, see Camerer and Loewenstein (2004).

4 The Reserve Bank of India, in its latest Monetary Policy Report (October 2017) has said that it intends to use the benchmark model of this kind: a Dynamic Stochastic General Equilibrium model, for forecasting and policymaking.

5 There are many other alternative approaches, including ones that revert to classical economics, which was behavioural by design. See Camerer (2005) for quotes from Adam Smith, where he describes what have come to be known as loss aversion and endowment effect.

6 For a detailed description of Agent-based Modelling in economics and arguments for furthering this approach, see Farmer and Foley (2009).

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