Shun the rational agent to rebuild economics

Paul Ormerod***** (Volterra Consulting, UK)

Philip Ball's recent article on mainstream economics ("Baroque fantasies of a most peculiar science", *Financial Times*, Comment October 30, 2006) has attracted strong criticism on the letters page. Mr Ball argues that the subject relies on the rational, omniscient decisionmaker. Further, it has mistakenly placed an idea from physics - that of thermodynamic equilibrium - at the core of its theory. His critics claim that this is a caricature of the subject. Substantial advances have been made, they say, particularly in the last 10 to 15 years.

This latter point is certainly true. The list of economics Nobel laureates in the 21st century is largely made up of scholars who have worked outside the traditional rational agent paradigm of neo-classical economics. The work of Daniel Kahneman at Princeton University and Vernon Smith, at George Mason University deserves special mention. They created, almost on their own, the discipline of experimental economics. Standard economics merely assumes that people act in a particular way. Mr Kahneman and Mr Smith tested how people really do behave.

Their conclusions are a devastating blow to the postulates of the rational decisionmaker. In general, people gather limited information, reason poorly and act intuitively rather than rationally. All scientific theories, even quantum physics which has survived the most rigorous empirical tests, are approximations to reality.

The question is, in any application: how good is the approximation? In limited circumstances, the con-ventional economic view of rational behaviour is a good one. But most of the time it is a poor approximation, sometimes very poor. Its use can give seriously misleading views of how the world actually operates.

The challenge of reconstructing economic theory virtually from scratch makes it an exciting time to be an economist. It is attracting eminent researchers from other disciplines, such as mathematical sociology, computer science and statistical physics. One from the last of these, Doyne Farmer of the Santa Fe Institute, has a model that replicates many of the subtle features of prices on the London Stock Exchange. But far from assuming that traders are rational, he postulates that they have literally zero intelligence. Yet the model works very well.

The problem, and it is a very big one, is that most economists continue to act as if very little has changed and that the rational agent postulate remains generally valid. Game theory, for example, has come to dominate much of economics. But outside the realms of auctions designed by economic theorists, it has few practical applications. The prisoner's dilemma, one of the most famous games where individually rational actions can give rise to an outcome that no one would choose, has been studied intensively for over 50 years. Yet, except in wholly trivial cases, the "optimal" - a word beloved by economists - strategy remains unknown. The demands placed on the cognitive abilities of decisionmakers in game theory are stupendous. A logical implication of the game theoretic view of the world is that the axioms of mathematics merely have to be stated for everyone immediately to know all the theorems of maths.

The textbooks used to instruct most students have, if anything, gone backwards in recent years. Aimed at the mass market of US community college students, they have dumbed down the subject to a terrifying degree. Even the material presented to strong students is replete with "theorems" and "lemmas" based on postulates of behaviour that have been discredited empirically within economics itself.

In practice, even professional economists fall back all too readily into the comforting world of the con-ventional rational agent. Competition policy, for example, is still derived from these theoretical principles, leading to the erroneous view that markets with fewer companies are necessarily less competitive. Yet the consumer has benefited enormously from innovations in markets such as food supermarkets and information technology that are dominated by a small number of large companies.

Even the very, very best are not immune to the temptation. Kenneth Arrow of Stanford University is perhaps the most distinguished economic theorist of the second half of the 20th century. He established, decades ago, fundamental results in general equilibrium theory, the central core of conventional economics. Professor Arrow has subsequently been severely critical of this theory, describing it as being "empirically falsified". This year he addressed the British Association for the Advancement of Science on "economics and sustainability". Which model did he use to draw his conclusions? The rational, maximising representative decisionmaker!

So, yes, at its frontiers economics is changing dramatically in exciting and challenging ways. But almost all economics as it is actually taught and practised lags many years behind.

*** Paul Orermod** is a director of Volterra Consulting and author of the *Death of Economics* (John Wiley & Sons). His latest book is *Why Most Things Fail* (Faber & Faber).

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