

of distortion that friction and the other 'accidents' would determine and which the law ignored. In other words, whereas in natural sciences the 'disturbing causes' have their own laws, this is not the case in economics where we find tendency statements with unspecified *ceteris paribus* clauses or, if specified, specified only in qualitative terms. In economics it is generally impossible to list all the conceivable inferences implied in a lawlike statement and to replace the *ceteris paribus* clause with precise conditions. So, for example, the law that 'less will be bought at a higher price' is not refuted by panic buying, nor is it confirmed by organized consumer boycotts. No test is decisive unless *ceteris* are really *paribus*.

These remarks help to understand the role acknowledged by Keynes to laws in economic inquiry. Besides general laws, there are also rules and norms which are significant in the explanation of economic behaviour. To Keynes, it makes no sense to reduce all forms of explanation in economics to that of the covering-law model. Indeed, whereas to justify a law one has to show that it is logically derivable from some other more general statements, often called principles or postulates, the justification of rules occurs through the reference to goals and the justification of norms through the reference to values which are not general sentences, but rather intended singular patterns or even ideal entities. Since no scientific law, in the natural scientific sense, has been established in economics, on which economists can base predictions, what are used and have to be used to explain or to predict are tendencies or patterns expressed in empirical or historical generalizations of less than universal validity, restricted by local and temporal limits. Recently, Arrow has amazed orthodox economists when raising doubts about the mechanistically inspired understanding of economic processes: 'Is economics a subject like physics, true for all time or are its laws historically conditioned?' (Arrow, 1985, p. 322).

The list of generally accepted economic laws seems to be shrinking. The term itself has come to acquire a somewhat old-fashioned ring and economists now prefer to present their most cherished general statements as theorems or propositions rather than laws. This is no doubt a healthy reaction: for too long economists have been under the nomological prejudice, of positivistic origin, that the only route towards explanation and prediction is the one paved with laws, and laws as forceful as Newton's laws. Images in science are never innocent: wrong images can have disastrous effects.

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economic man. Among the many different portrayals of economic agents, the title of *homo economicus* is usually

reserved for those who are rational in an instrumental sense. Neoclassical economics provides a ready example. In its ideal-type case the agent has complete, fully ordered preferences (defined over the domain of the consequences of his feasible actions), perfect information and immaculate computing power. After deliberation he chooses the action which satisfies his preferences better (or at least no worse) than any other. Here rationality is a means-to-ends notion, with no questions raised about the source or worth of preferences. The rational economic man is a bargain-hunter, who never pays more than he needs or gets less than he could at the price.

This basic model is then made more sophisticated. The theory of risk allows for the point that an action may have several possible consequences. The agent assesses its expected utility by discounting the utility of each consequence by how likely it is to be the actual one. That requires him to have a probability distribution for the consequences, even if only a subjective one. Other refinements include allowance for costs of information, of its processing and of action. Then there are complexities, perhaps best illustrated by the theory of games, when other agents are introduced into the story. The basic vision remains, however, one of agents who are rational in the sense that they maximize an objective function subject to constraints.

This vision is not unique to neoclassical economics. For example, Marx's profit-maximizing capitalist fits the same instrumental model of rationality. Institutional accounts of, for instance, banks or trade unions often conceive economic bodies as unitary rational agents similarly. Nor is the vision confined to any specific motivating desire in agents, like a selfish pleasure-maximizing drive. There is scope for allowing ethical preferences alongside the symptomatic textbook desires for apples and oranges. Agents are, however, regarded as self-interested, in the looser sense that they are moved to satisfy whatever preferences they happen to have. Furthermore, granted that *de gustibus non disputandum*, this modest base is enough to ground a full-blown social theory on a model of agency which can be exported to other social sciences.

Such a social theory is individualist and contractarian, with a pedigree which includes Hobbes's *Leviathan* and Benthamite utilitarianism. The satisfaction of individual preference, aided by felicific calculation, is what makes the social world go round. Social relations become instrumental, in the sense that they embody exchanges in the service of individual preferences. For instance, marriage has been analysed in this spirit: as an arrangement to secure the mutual benefit of exchange between two agents with different endowments. Crime has been claimed to occur because calculation of costs and benefits proves it to be the action which maximizes expected utility. Meanwhile, institutions, which feature in elementary microeconomics as constraints on individual choice, become deposits left by earlier transactions, often deliberately deposited as devices to prevent preferences being frustrated by situations of the prisoner's dilemma type. Government policies are explained on the hypothesis that the political arena is also peopled by individuals maximizing expected utility, who form coalitions to market policies which will secure re-election. In this sort of way *homo economicus* turns into a universal *homo sapiens*.

Such a full-blown social theory may be too ambitious, because assumptions which are plausible for simple market transactions become suspect when scaled up. For example, the ideal-type case makes agents, so to speak, transparent to themselves, and does not allow for history occurring behind men's backs. Freudians would object to transparency of

preferences and Marxians would invoke theories of false consciousness. (Although Marx's capitalists are instrumentally rational, their desire to maximize profit is an alienated one, 'forced' on them by a competitive capitalist system.) Many other social theorists would object to the treatment of norms and social relations as instrumental, on the grounds that norms are prior to preferences. For instance, cultural forms like the rules of orchestral composition are a source of musical preferences rather than a solution to *a priori* problems of maximizing musical enjoyment. In general it can be argued that ambition overreaches itself at the point where it reduces the parameters, needed for analysing economic choice as instrumentally rational, to outcomes of rational choice.

Meanwhile, however, such objections need not affect the more modest enterprise of explaining economic transactions within the parameters of a market. But even here *homo economicus* has his critics. Philosophically, it is not plain that preferences can be taken as given in a sense which makes them impervious to the agent's beliefs about the moral quality of his actions. In supposing that only desires can motivate agents, the economist is taking sides in a continuing philosophical dispute between Humeans, who regard reason as the slave of the passions, and Kantians, who make place for the rational monitoring of desire. This dispute surfaces plainly in welfare economics, when it is asked whether all preferences should count equally, but bears on the elementary model of action too. There are also methodological doubts about the empirical standing of the model. What would falsify the claim that economic agents seek the most effective means to satisfy their preferences? Apparent counter-examples can always be dealt with by treating them as evidence that preferences have changed. Indeed, since preferences are unobservable, they can be identified only if the correctness of the model is presupposed. In other words, there is room for deeper dispute about the foundations of orthodox microeconomics than is always realized.

Even within economics there are critics. The most substantial attack comes from those who think that perfect information is not a useful limiting case of imperfect information. Granted that there is often no way of calculating the likely marginal costs and benefits of acquiring extra information (short of actually acquiring it), how shall the agent decide rationally when to stop? Simon (1976) uses the question to argue for 'satisficing' models, in place of maximizing ones, and for 'procedural' rationality. Rationality, he suggests, is a matter of following a procedure which halts with a good solution, and should not be defined in terms of best solutions. Instead of grounding explanations in ideal-type cases, economists should direct their attention to the procedures which businesses and consumers in fact follow and, hence, regard *homo economicus* as more of an Organization Man than an abstract maximizer.

On the other hand, *homo economicus* has proved to be a mathematically tractable assumption of a fertile kind. To portray action as optimizing a reasonably well-behaved objective function is to make possible the analytic insights got by use of calculus, set theory and other powerful mathematical tools. By comparison, satisficing models have fared less well by having to rely on simulation techniques. It is computationally cumbersome to explore the equivalent of the comparative static properties of these models, and the generality of the results obtained is open to suspicion.

A different approach to the information issue comes from the Rational Expectations School. They argue that a rational agent who is short of information should not use an information-generating mechanism which gives rise to systematic errors. If errors are systematic, the agent should be able to

learn how to eliminate them by amending the mechanism. There is an incentive to do so, because improved estimates of future variables will be profitable. On the face of it this makes rational expectations the natural ally of economic-man models. Economic Man can proceed much as before, in the assurance that inadequate information involves nothing more systematic than 'white noise' and with the benefit of fresh analytic results which flow from a rational expectations hypothesis.

But this is to sidestep the informational problem set earlier, unless one sees how rational agents will learn to remove systematic errors. In some simple learning situations a Bayesian updating procedure turns a rational expectations generating process into an approximation of adaptive expectations, which could be construed as a procedural rule of thumb. But no general rapprochement between maximizing and procedural models of rationality follows. In more general learning situations the rational agent is trying to learn the rational expectations equilibrium relationship between variables – the one which, if used by agents to form their expectations, would reproduce itself in experience (white noise apart). This sounds easy, in that repeated experience of a particular relationship should lead to convergence on accurate parameter estimates. However, ignorance of the rational expectations equilibrium values produces behaviour which departs from those values. So observed values of variables embody a distortion which agents cannot correct without knowing the dimensions of their own ignorance. To know this, however, they would have to know the rational expectations equilibrium values already. To put it as the procedural critics might, learning would be feasible only if there were nothing to learn. The information question has been begged.

Yet Economic Man remains a powerful model of action not only in neoclassical theories, where insights in comparative statics have been especially notable, but elsewhere too. How powerful it finally is depends, within economics, on what becomes of the informational difficulties and on whether a procedural model can come up with rival results of equal scope and elegance. On the export front it offers a tempting analysis of social behaviour at large both for transactions in other social arenas and for the emergence of the institutions which govern those arenas. But the greater its ambitions, the more serious become the unresolved doubts about the origin of preferences and their relation to norms and institutions.

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See also ALTRUISM; ECONOMIC THEORY AND THE HYPOTHESIS OF RATIONALITY; HEDONISM; RATIONAL BEHAVIOUR; SELF-INTEREST; UTILITARIANISM.

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economic organization and transaction costs. One important extension of the Coase Theorem states that, if all costs of transactions are zero, the use of resources will be similar no matter how production and exchange activities are arranged. This implies that in the absence of transaction costs, alternative institutional or organizational arrangements would provide no basis for choice and hence could not be interpreted by economic theory. Not only would economic organization be randomly determined; there actually would not be any