

Back to Reality

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In recent months a number of French students, joined by some of their lecturers, have initiated a debate on the state of modern economics. The debate turns on the question of which research methods are appropriate for the investigation of economic reality. As so often in the past, a French debate has provoked an international response. Because of the importance of this debate to the future of economics it is essential to be clear about what is issue, especially in these pages where the debate began.

Simply put, the message from the students is that there is insufficient pluralism in the modern economics faculty. In particular, there is a widespread insistence on the use of just one set of methods: those of mathematical modelling.

A standard response to this observation, one which is also found in recent pages of *Le Monde*, and the one I would like to address here, and is that this emphasis is unavoidable just because economics needs to be scientific, where being scientific necessitates the use of mathematics.

When stated as starkly as this I think it will be seen that the response is inadequate. Most clearly it begs the question as to why economics needs to be scientific. But actually, its central deficiency is to presume unquestioningly that a science necessarily uses mathematics. Such a presumption is false. What is more, a little reflection on the nature of natural science suggests that there is every reason to suppose that even an economics almost devoid of mathematics can yet be scientific in the sense of natural science. Thus the heading in *Le Monde* of 31/10/2000: “Les mathématiques, condition nécessaire mais pas suffisante aux sciences économiques” is actually quite wrong. Let me briefly elaborate.

I take it we all agree with the French students that illuminating social reality is the primary objective. Certainly, I find few, if any, commentators rejecting this goal explicitly. The point here is that mathematical methods of the sort used by economists are (as with any methods) useful to the task of illuminating reality only under certain conditions. Specifically, the usefulness of the sorts of mathematical procedures in question is restricted to systems in which event regularities (deterministic or probabilistic) occur. Thus for those who suppose that science means using mathematics, the assertion that economics can and ought to be scientific is, in effect, a claim that event regularities prevail in the social realm.

Maurice Allais, one of France’s great economists, has formulated this claim explicitly when he writes:

“ The essential condition of any science is the existence of regularities which can be analysed and forecast. This is the case in celestial mechanics. But it is also true of

many economic phenomena. Indeed, their thorough analysis displays the existence of regularities which are just as striking as those found in the physical sciences. This is why economics is a science, and why this science rests on the same general principles and methods of physics” (Allais, 1992, p. 25).

But Allais is actually quite wrong in both aspects of his claim. Econometricians repeatedly find that their supposed correlations are no sooner reported than they are found to break down; social event regularities of the requisite sort are hard to come by. And, more to the point, it is just not the case that event regularities are essential to science. Let me defend this claim.

Actually, although the successes of natural science are widespread, event regularities of the requisite sort are rather rare even in the natural realm; outside celestial mechanics they are mostly restricted to situations of well-controlled experiment. Furthermore, most of the results of well-controlled experiments are successfully applied outside the controlled experiment where event regularities are not at all in evidence.

We can make sense of these observations only by realising that the aim of the controlled experiment, and of science more generally, is not the production of an event-regularity *per se*, but the identification of an underlying mechanism that can account for it. Gravitational forces may give rise to an event regularity in an experimental vacuum, but gravitational forces continue to act on autumn leaves wherever the latter may fly, and help us to send rockets to the moon.

It is an understanding of the mechanism not the production of an event regularity that is the essential goal here. The controlled experiment constitutes a human intervention aimed not at producing an event regularity for its own sake but at empirically identifying (or testing a theory about) an underlying mechanism.

Medical researchers are not interested in correlating the temperature of a patient with the intensity or location of spots on the patient’s body, but with identifying (and counteracting) the virus or cause behind the symptoms.

In short, *if* there is a unifying feature of (pure) science, it is the search for causes behind phenomena regarded as of interest. If there is an essential component common to all successful science it is this movement from phenomena at one level to their explanation in terms of causes lying at a deeper one. Mathematics is useful in the few (typically experimental) cases where surface phenomena are correlated. But science goes about its work of uncovering causes even where correlations in surface phenomena are not to be found.

So science is quite feasible in economics. It entails identifying the causes of phenomena of concern, say of high levels of unemployment or poverty. If mathematical methods are useful to this process, then so much the better. The central point, though, is to recognise that whether or not they are useful mathematical modelling methods are not necessary for any research process to qualify as being scientific in the sense of natural science. My Cambridge colleague Professor Amartya Sen was correct when recently in *Le Monde* (31/10/2000) he observed that

mathematics is not a unique foundation of economic science. *In fact it is not a foundation of economics-as-science at all.*

Actually, it is my own view that we can go further than this. We have good reason to suppose that the scope of relevance of mathematics is very limited indeed in the social realm. For example, it can be demonstrated that not only the poor success rate of modern economics, but also the phenomenon of modern economists repeatedly making assumptions known to be wildly false, are due to mathematical methods being employed where they do not fit. These are amongst the assessments I defend at length in *Economics and Reality* (Lawson, 1997). But they are not essential to the points being made by the French students, and I put them aside here. The students' "complaint" is only that, in modern academic economics departments, mathematical modelling is pursued for its own sake. They argue, and I agree, that we should start with (or at least not neglect insights concerning) the nature of reality. The point is not to reject mathematical methods *a priori*, but to use such methods as and when appropriate.

One final point. I have set out a conception of science that some will contest. It is possible indeed that it will prove inadequate. Or time may show that my pessimism about the relevance of mathematical modelling for economics is unfounded. All knowledge is fallible, after all. But to recognise that any argument or claim can turn out to be wrong is to acknowledge, at the same time, a need for non-dogmatic, indeed more pluralistic, approach in the academy.

This, of course, is just the first and most fundamental point of those of us who are unhappy with the state of modern economics. The objective is not to replace one dogma by another. Certainly it is not an *a priori* rejection of the use of mathematics in economics. Even less is it a rejection of the possibility of economics as science. And nor is anyone suggesting an abandonment of standards of rigour in the return to relevance. Rather, the goal is simply to open up the economics academy to a more intellectual orientation, allowing, in particular, the combining of high standards of research with a return to variety and greater (albeit critically informed) pluralism in method.

References

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