Of Astrology, Sherlock Holmes, and Econometrics

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There is very little in the social sciences that resembles the objective and ideal quest for truth which we meet in physics...[yet] the success of mathematical economics shows that one social science at least has gone through its Newtonian Revolution (Popper).

Econometrics: Computerized economic astrology(Hutchinson).

The above quotations summarise two opposing viewpoints concerning the utility of econometrics. This paper will argue from the perspective of the latter.

There are two questions which must be asked before an evaluation of econometrics' contribution to the scientific status of economics can be made. Firstly, what is a science? Secondly, is economics a science? It will here be contended that the application of econometrics is a necessary condition for economics to be a science. However, whether it is sufficient or not is moot. In the best economic tradition, the argument here is inconclusive: two alternative conclusions are proffered.

The discussion proceeds as follows. Section one first adopts Hicks' definition of a science, and endeavours to apply it to the discipline of economics. Section two then examines the problems which economics the science faces. Attention is focussed firstly on those rooted in the subject matter of economics, and secondly on those relating to the application of econometrics. Section three, the denouement is in two parts, one relevant for realists, the other for the consumption of economists.

Economics the science

Hicks (1986) defined science as a "body of propositions" with the following three characteristics: (i) they are about real things - observed phenomena; (ii) they are general, pertaining to classes of phenomena and the relations between these classes; and (iii) they allow tenable predictions to be made on their basis[1].

Before addressing the issue of whether economics is a science, it is worthwhile asking if it makes any difference whether it is or not.

In the last resort, the main function of economic study must be to allow for constructive policy-making. It is not necessary to specify the most appropriate policies - economics aims to formulate means towards different ends rather than the ends themselves. Given this function, it follows that economics must be a science in the sense defined above. It must be based on observed phenomena, and offer general propositions about these phenomena from which worthwhile policy prescriptions can be distilled.

From the above, it follows that econometrics seems to be a necessary condition for economics to be a science. Econometric methods can be interpreted as statistical methods specifically adapted to the peculiarities of economic phenomena. It provides the tools for aggregating,

1 Adopting this definition allows us to avoid the problems of comparing economics to the natural sciences. Arguments such as "economics is not a science because it is not like physics" become redundant and the scientific status of economics can be evaluated in isolation.

measuring, testing and forecasting. In its absence, economics would not be able to furnish the requisite "body of propositions" to validate its classification as a science.

The question remains, however, as to whether the application of econometrics is a sufficient condition to justify this classification. It is this contentious issue which the next section addresses in detail.

Economics the science of problems

Each of the three characteristics of a science delineated above are here dealt with in turn. The argument will be that economics is a science in the sense defined above, although one with major problems.

Economic theory must be based on observed phenomena

Econometrics allows aggregation and measurement of facts. Once we have our "observed phenomena", econometrics can deal with them. The problem, however, lies in observing the phenomena.

Figures can be multiplied, divided, raised to powers, regressed, lagged and modified in any number of other ways. Yet if the person who collected them was in a hurry to get home for dinner, he or she may well have written down whatever came to mind. Questionnaires also admit of less than candid reporting. Hence the motto of the British CSO: "If a figure looks interesting, its probably wrong."

It has been said that everything in economics depends on everything else. This "everything else" includes sociological, psychological and cultural factors. Yet such influences cannot be quantified. Marshall claimed that, as a result, the application of mathematical models to economic phenomena represents a waste of time, and indeed, in the large majority of cases is positively misleading. Even if the importance of these factors could be quantified, it would not be possible to separate out their individual impacts. Identification, specification and multicollinearity problems therefore inevitably impinge. In economics, one can only understand one thing if one understands everything.

It is thus clear that value judgements must be made in econometrics, admitting of ideological bias and "guesstimates". Hence, although economics is based on observed data, the accuracy, relevancy and significance of its conclusions remains seriously in doubt. To quote Worswick:

> "Econometricians are not, it seems to me, engaged in forging tools to arrange and measure actual facts so much as making a marvellous array of pretend tools which would perform wonders if ever a set of facts should turn up in the right form"(Worswick,1972).

Econometrics must provide a body of general propositions

Econometrics is necessary and sufficient in this sense in so far as it does indeed allow economic theory to provide such a body of general propositions. However, the problems discussed in the last section remain relevant. Cognizance must also be taken of the fact that, even if there were no observation problems, interpretation of data depends on the individual theorist. As one commentator has noted: "...if all economists were laid end to end, they still would not reach a conclusion." The question then arises as to whether the propositions furnished are reliable.

The difficulties encountered are magnified by the somewhat specious relationship that exists between econometrics and theory. At its simplest level, there are two opposing points of view.

If Sherlock Holmes were an economist, he would undoubtedly be representative of the first of these, the empiricists. He might

say to Watson: "It is a capital mistake to theorise before one has data. Insensibly one begins to twist facts to suit theories instead of theories to suit facts." The problem with this Friedmanite approach is that relevant data may be ignored, resulting in the specification of incorrect causal relationships[2]. In addition, if new data yields revised estimates of economic parameters, there is no way of telling whether the previous hypotheses were wrong, or if this new one is wrong, or if things have simply changed in the meantime (Machlup,1978). If further theories are built on single theory formulated in this way, new data may cause the whole edifice to collapse if it renders the basic theory incorrect. It is thus clear that proponents and practitioners of this approach leave themselves open to indictment.

The second group are the traditionals, and they work in a diametric fashion, first formulating theories and then seeking out data for the purposes of falsification. For the hardliners, no data can ever prove a theory wrong. This dogmatic approach can also be deemed culpable for incorrect specifications. Further, it magnifies the problem of conflicting theories: those that cannot be disproved tend to have a long life.

The contemporary eclectic endeavours to combine aspects of these two approaches - theories are formed based on *a priori* reasoning, and subsequently modified in line with the data. Such a methodology remains open to the same or similar criticisms as apply to the approaches it synthesizes, but not to the same degree.

The conclusion to this section is therefore that, while econometrics does indeed provide the necessary tools to enable a "body of propositions" to be formulated and forwarded, the contexts in which these tools can be applied remain open to interpretation. It must then be asked if the propositions so generated are credible.

Economic theory must provide believable predictions.

Forecasting is important in policy making and econometrics provides the techniques to facilitate it. Yet as was shown above, there can be conflicting evidence and conflicting theories leading to conflicting predictions. The most serious problem, however, is that, even if these problems did not impinge, the fact that the subject matter is "time-based" renders all predictions suspect. As a result of pervasive uncertainty, it is impossible to specify for how long economic forecasts, such as they are, remain valid. The degree of confidence which attaches to our predictions is correspondingly debilitated. As Cairncross writes:

> A trend is a trend is a trend-
> But the question is will it bend?
> Will it alter its course
> through some unforeseen force
> And come to a premature end?

Hicks (1986) points out that random, once-off events cannot be dismissed as unimportant. Examples include the oil shocks and the breakdown of the Bretton Woods system. The effects of these were not predicted by economists, largely because there was nothing in history to indicate what might happen. Hicks concludes that economics is related to history in a way that science is not.

Conclusion (for realists)

The relevant questions then are: (i) who put the "con" in economics? and (ii) who put the "trics" in econometrics? Admittedly, economics is based on observed phenomena, and it does generate credible propositions about classes of

2 For example, in summer people drink more beer. Also in summer, river water levels drop. Therefore, beer is brewed using river water.

phenomena and the relations between these classes. So by the initial definition, economics is a science. Yet having discussed the range of problems which encroach, Malthus is vindicated in his assertion that it is a dismal science of very little, if any, use to the policy-maker. Econometrics - a scientific approach - can only be successful in so far as its subject matter is scientific. That of economics being dismal, econometrics can only make a dismal contribution.

Conclusion (for economists)

Assume there are no problems, or take Sir Dennis Robinson's advice: "...look these awkward problems squarely in the face - and pass rapidly on."

References

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